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1970

ANNUAL REPORT

1971

HETCH HETCHY WATER AND POWER

DOCUMENTS DEPT.

MAR 11 1969

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DON PEDRO DAM

PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO

CITY AND COUNTY OF SAN FRANCISCO

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JOHN D. CROWLEY - General Manager

HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to Hetch Hetchy employees, past and present, whose devoted and conscientious efforts have made possible these accomplishments for San Francisco.



Wapama Falls
Hetch Hetchy Reservoir

HIGHLIGHTS - 1970-71

On May 22, 1971, Mayor Alioto dedicated the new Don Pedro Dam (cover), a cooperative project constructed by Hetch Hetchy and the Turlock and Modesto Irrigation Districts on the Tuolumne River. This Dam, the second highest in California, just about doubles the water available for distribution by the San Francisco Water Department from the Hetch Hetchy System; from 220 to 400 million gallons daily.

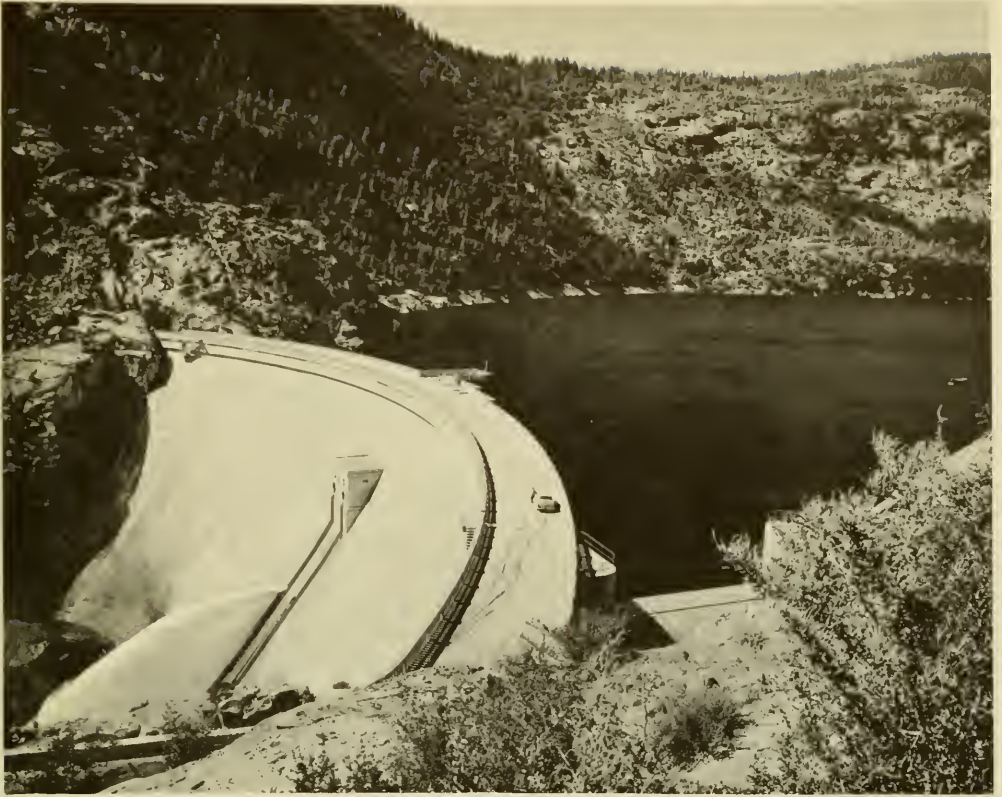
Hetch Hetchy power revenues continued to climb, reaching an all-time high of \$14,981,938.14. This is probably as much as the system will earn with the present generating facilities. Net operating revenues from power sales dropped slightly to \$6.4 million, as operating expenses, principally wages and salaries, continue to rise.

\$2.17 million in Hetch Hetchy power revenues were appropriated this year for the operation, maintenance and improvement of the electrical facilities of the San Francisco Municipal Railway, thus sparing City taxpayers the paying of this amount as an additional subsidy.

Hetch Hetchy furnished power for the Muni and all other Municipal purposes at rates 21% below those which would have been charged by the Pacific Gas and Electric Company, a further saving to the taxpayers of about \$915,000 (See p.4).

The rate of street lighting improvement hit an all-time high, as replacements maintained and operated by the Department were installed at a cost exceeding \$2 million. San Francisco is rapidly becoming truly a "City of light".





O'Shaughnessy Dam and Hetch Hetchy Reservoir

ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, HETCH HETCHY WATER AND POWER and BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy Water and Power is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. Approximately three-fourths of the water consumed in San Francisco and the Water Department service area comes from this source. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.



Through its Transit Power Division, Hetch Hetchy has operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Transit System since July 1, 1969. At that time, the Public Utilities Commission decided to transfer the responsibility for the conversion and distribution of electrical power to streetcars and trolley buses in San Francisco from the Municipal Transit System to Hetch Hetchy Water and Power. Now, Hetch Hetchy not only generates and transmits the electrical power from the Sierra Nevada to the Bay Area, as it has in the past, but distributes this power directly to the transit vehicle.

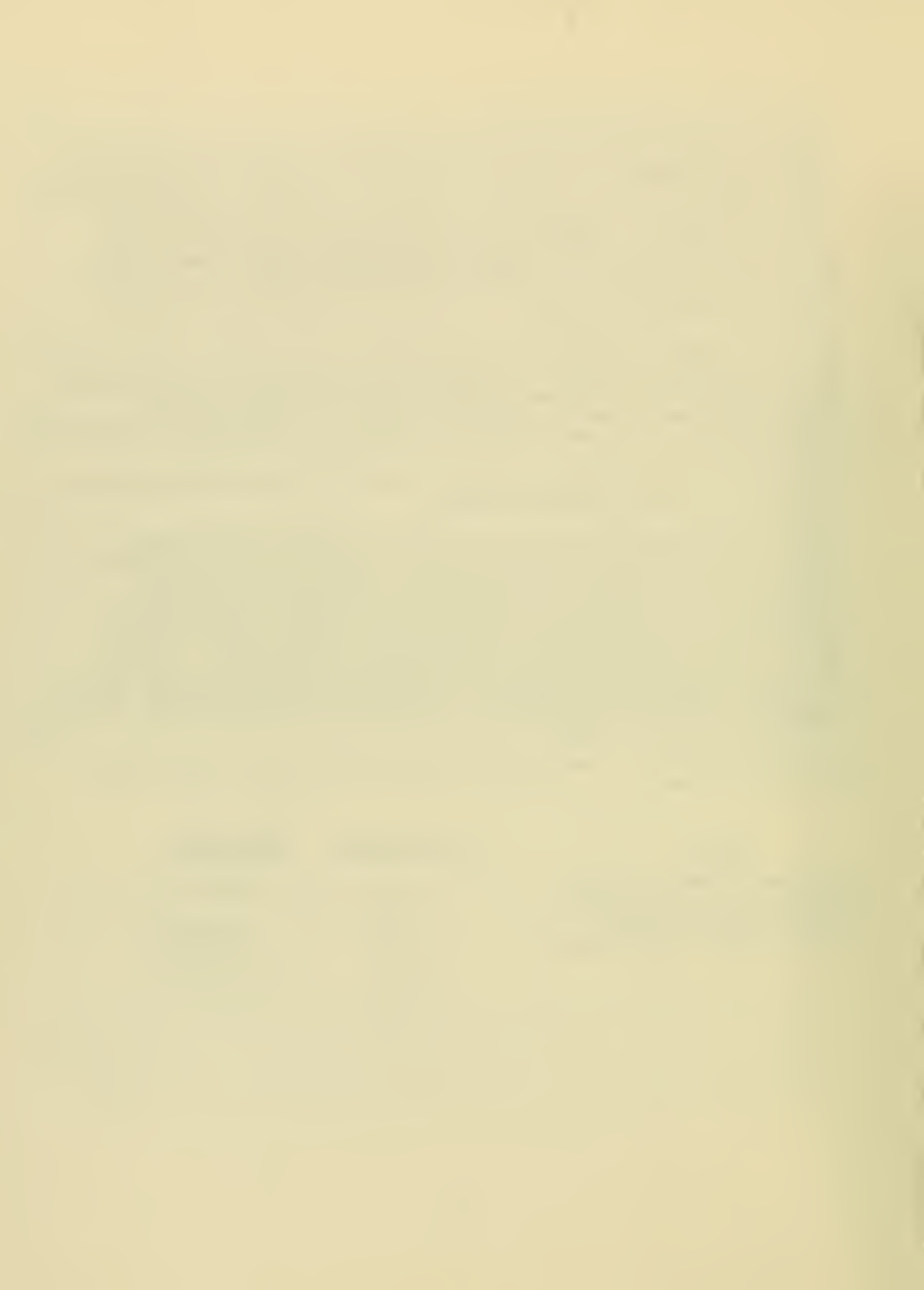
In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Overhead Lines and Motive Power Sections of the Municipal Transit System. Personnel for this division includes fifty-one employees in twelve different categories. Last year this responsibility cost Hetch Hetchy, and saved San Francisco taxpayers, \$2.17 million.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design, and construction of City-owned street lighting improvements are under the jurisdiction of Department of Public Works. In accordance with provisions of the City and County Administrative Code, plans for these improvements must be approved by the Public Utilities Commission through this bureau. The bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1970-71, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>No. of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	194	\$ 16,922,725
Hetch Hetchy Water and Power (Transit Power Division)	51	2,172,325
Bureau of Light, Heat and Power	12	6,477,334
	257	\$ 25,572,384



HETCH HETCHY WATER AND POWER SYSTEM

REVENUES AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and seven industrial customers:

Kaiser Cement and Gypsum Corporation	Santa Clara County
Kaiser Aluminum and Chemical Corporation	Santa Clara County
Hercules, Inc.	Contra Costa County
California Ammonia Company	San Joaquin County
Air Products and Chemicals	San Joaquin County
Valley Nitrogen Producers	Fresno County
Morris Industries, Riverbank	Stanislaus County

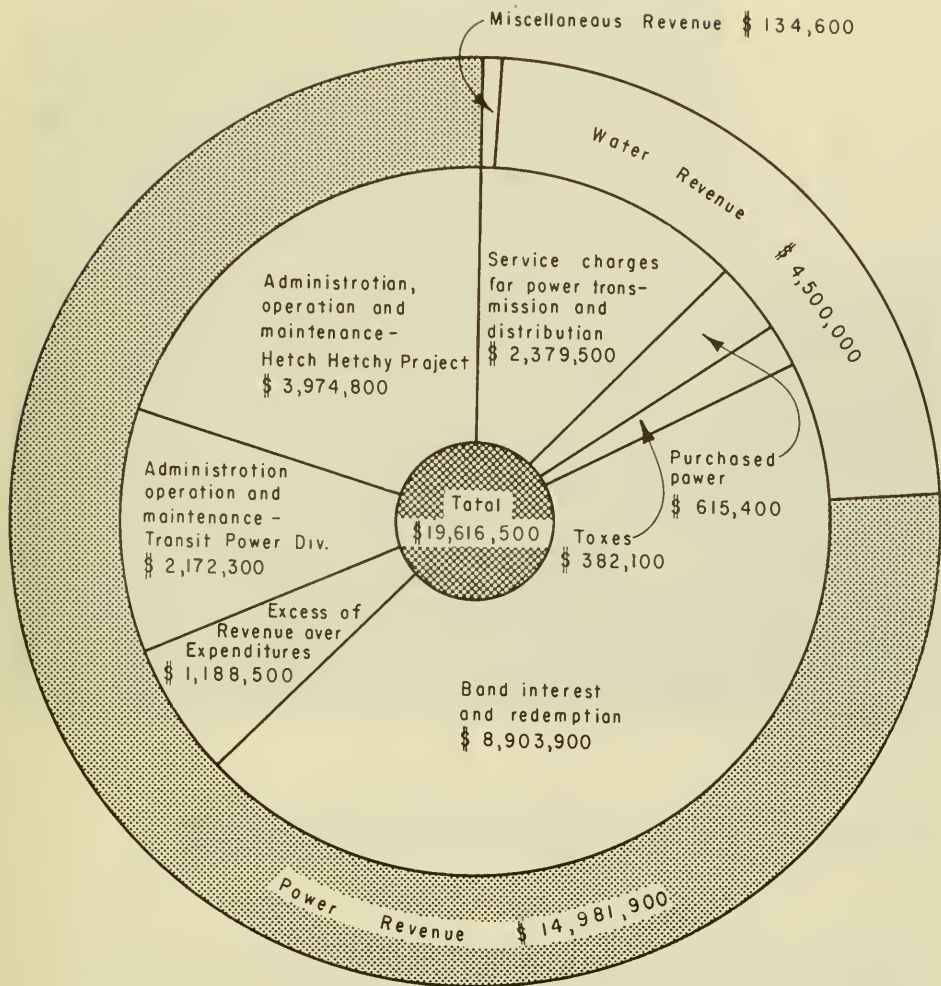
2. Sale of Water to the San Francisco Water Department.

This past year, revenue from sale of water and standby service to the San Francisco Water Department was \$4,500,000.

Gross sales of electric energy amounted to \$14,981,938, compared to \$14,090,231 during the year 1969-70. This increase in electric revenue reflected the increase in actual sales during the year; 2,065,245,950 kilowatthours, as compared to 1,935,944,152 kilowatthours for 1969-70. This was made possible by maximum generation during the 1970 spring runoff period, reflecting an excellent water yield. The large surplus of electric energy delivered to the Pacific Gas and Electric Company during this period was withdrawn in the ensuing months, as it was needed to sustain the customer loads.

Revenue for service orders, rentals, meals and miscellaneous items totaled \$134,544.

Expenditures are summarized on the pie chart following and are detailed in the appendix.



HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1970-71



Moccasin Powerhouse

1. Dick Adler, Electrical Maintenance and Operations Superintendent
- r. Bob Stein, Superintendent of Operations

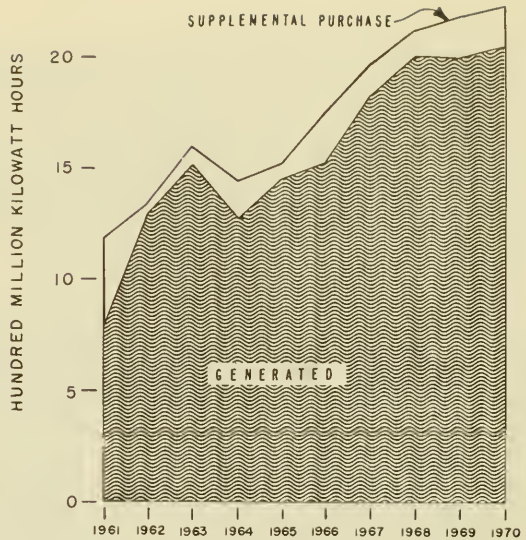
POWER SALES

Power and energy delivered to all City Departments collectively increased by 7.3% (See Appendix, Table 12). Individually, the changes in consumption among the departments varied between a decrease of 3.4% for the Municipal Railway on one hand, and an increase of 14.1% for the San Francisco International Airport on the other. Hetch Hetchy power is sold to City Departments at cost, representing a saving to taxpayers for 1970-71 of approximately \$915,000, compared to the cost if supplied by the local investor-owned utility.

Power and energy delivered to Modesto Irrigation District and Turlock Irrigation District increased by 14.2 and 18.6 per cent, respectively, this year. The tremendous increase is partially the result of steady

load growths experienced by these two Irrigation Districts. Also, the old Don Pedro power plant was shut down on October 15, 1970, to allow salvage operations to take place before the impounded water behind the new dam flooded the old power plant. During the interim between shutdown of the old plant and actual commercial operation of the new, the two Districts purchased all of their power requirements from City.

Since 1940, the Modesto and Turlock Irrigation Districts and the City and County of San Francisco have been cooperating in the further development of the water resources of the Tuolumne River Basin. Under the terms of the 1949 agreement, known as the "Third Agreement", the two Districts applied a \$4,600,000 Federal flood control grant to the construction of Cherry Valley Dam, and for this contribution the two Districts were permitted to purchase at cost a total of 35 percent of the firm generating capacity of City's Dion R. Holm (Cherry) Powerhouse

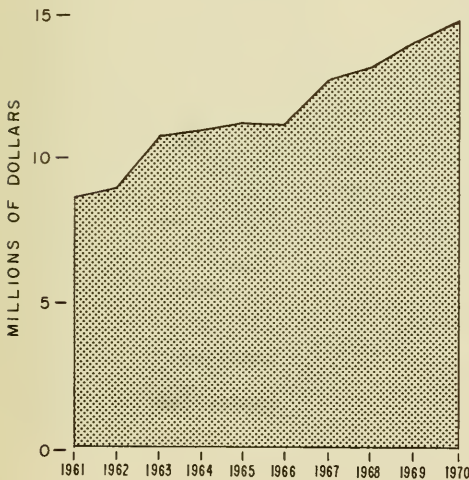


HETCH HETCHY
ENERGY GENERATION AND PURCHASE

until such time as New Don Pedro Project was completed. This entitlement has now terminated. Henceforth, sale of this portion of Hetch Hetchy energy will be at higher rates, returning greater revenue to City.

Cost of Service Study

R. W. Beck & Associates, consulting engineers, are completing a "cost of service" study for the Department, the results of which will be used as a basis for renegotiation of electric service contracts with Modesto and Turlock Irrigation Districts for terms beyond the termination dates of their current contracts. The study takes into account the Department's investment in the New Don Pedro Project in determining the cost of service. This is an appropriate inclusion, since generating capability is improved by our storage space in Don Pedro Lake, and part of the debt service thus incurred should be recovered from power revenues.



REVENUE FROM SALE OF ELECTRIC ENERGY

Increased Rates to Electric Customers

By Decision No. 78186, dated January 19, 1971, the California Public Utilities Commission authorized the Pacific Gas and Electric Company to increase its electric rate amount to more than \$51,000,000 in additional annual revenue. This decision directly affected City's charges to the two Kaiser customers whose electric service contracts had been assigned to City by the Company. The new rates which became effective February 13, 1971, will result in an increase to these industrial customers of approximately 4.5 percent in charges as compared to the old rates. Rates to the assigned chemical customers were not affected.

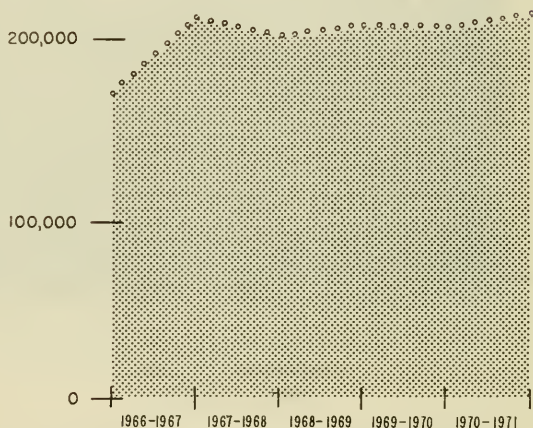
WATER PRODUCTION AND TRANSMISSION

Precipitation recorded for the year at our measuring stations was 88 percent of average; however, the resultant runoff was 92 percent of normal, indicating greater-than-normal precipitation at the high elevations. Careful scheduling and monitoring of releases by the City from its reservoirs was effected to assist the Irrigation Districts to meet their water needs in this first crucial year of Don Pedro Reservoir filling.

During the year, 68,488,800,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 77 percent of the City's total customer consumption. In addition, 267,911,000 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Laurence Radiation Laboratory at Livermore; 50,191,500 gallons were delivered to Groveland Community Service District in Tuolumne County.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.

Acre Feet
Delivered
To SFWD
300,000 —



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT

NEW DON PEDRO PROJECT

On May 22, 1971, the new Don Pedro Dam was dedicated by Mayor Joseph L. Alioto. This significant milestone was the culmination of ten years of effort on the part of officers and staff of the three constructing agencies; the City and County of San Francisco and the Turlock and Modesto Irrigation Districts. This \$100 million project (\$45 million City contribution) is a multi-purpose dam and reservoir which will provide the storage space to meet the growing demand for water of the San Francisco Water Department, at least into the first decade of the 21st century; provide water to fill the irrigation needs of farmers in the two districts; firm up power generation for the three agencies; furnish effective flood control on the Tuolumne River; and provide enormous recreational benefits for the people of California. The Federal and State governments furnished over \$14 million as an aid in construction to the Project for flood control, recreation, and fish and wildlife enhancement.



Don Pedro Lake
Moccasin Camp Ground
Entrance Kiosk

The new Don Pedro Project has generated some impressive statistics. The dam (585 feet high) is the second highest dam in the State; only Oroville Dam is higher. The reservoir (2,030,000 acre feet capacity) is the fifth largest in the State. When the reservoir is full, it will extend 26 miles upstream from the dam and will have a shoreline length of approximately 165 miles. Over \$5.5 million are being spent for recreational facilities in three locations. There is a recreation area at each end of the dam and upstream at Moccasin Point. Concessionaires will provide additional facilities such as marinas and buildings for dispensing food, beverages and other supplies.



Tuolumne River Watershed



Trolley Wires for Pure Air

TRANSIT POWER DIVISION

Two years ago the Public Utilities Commission established as policy its intent to make maximum use of non-polluting electrical energy in providing public transportation for San Francisco. This newest division of Hetch Hetchy Water and Power is responsible for supplying 600 volts direct current power to keep the streetcars and trolley coaches of the San Francisco Municipal Railway running.

The Transit Power Division is composed of two sections -- the Motive Power section and the Overhead Lines section. The Motive Power section operates and maintains seven substations which convert the electric power from 12,000 volts alternating current to 600 volts direct current.



(See Appendix Table 3.) The Overhead Lines section maintains the trolley wire overhead facilities and the electrical distribution system which conveys the power from the substations to the many feed points along the trolley wires. The electrical distribution system includes both overhead and underground feeder cables.

Motive Power Section

On Saturday, March 6, 1971, at 9:36 p.m., the unattended mercury arc rectifier at West Portal Substation was automatically shut down by its protective controls. Tests showed seven of the nine excitation control transformers to be defective. Two spare transformers were installed, and five of the defective transformers were delivered to Westinghouse Electric Corporation (the manufacturer) for rewinding, since Westinghouse had no spare units in stock. The rewound transformers were returned and installed on April 20, 1971. The failure or serious deterioration of these seven transformers was due to the heat of twenty years of operation in a confined space. The two transformers that tested "satisfactory" were recent replacements and had been in service for only a few years. During the 45-day period that West Portal Substation was out of service for repairs, its load was carried by Geneva Substation, with help from PG&E Substations N and K. The annual overhaul of the substation equipment was performed during the down time, to avoid a scheduled shutdown for such work later in the year.

On April 22, 1971, at 6:55 a.m., 1500 kw Motor-Generator No. 5 in Turk Substation developed an electrical fault to ground. Inspection showed that two, and possibly three, of the stator coils had a breakdown of insulation near the terminal leads of the motor and the short circuit current went to ground through the generator armature, causing further damage of an indeterminate amount. Specialists from General Electric Company (the manufacturer) examined the machines and estimated the cost of repairing between \$9,000 and \$10,000 which would require five or six weeks on a straight time basis. Since there is adequate capacity in the remaining three machines, and it is planned to replace the substation in the near future, it was decided not to repair the unit.

Overhead Lines Section

The primary function of the Overhead Lines section is to maintain in satisfactory operating condition the trolley wire overhead facilities and the electric distribution system which conveys power to it. During fiscal year 1970-71, the Overhead Lines section responded to 3,105 emergency calls. In addition to emergency repairs, this section has a regular and extensive maintenance program for overhauling all overhead facilities.



Overhead facilities are systematically inspected, and worn or damaged parts are replaced before they can cause accidents or malfunctioning of equipment. Also, damaged trolley support poles were straightened and reinforced to avoid costly replacement. Trolley support poles, which are needed to support street lights, were extended and/or relocated for more efficient street light coverage.

The Overhead Lines section repaired 18 cases of damage to the trolley overhead facilities and/or the electric distribution system, and the parties responsible for the damage were billed a total of \$30,242.89. The City was reimbursed for 13 of the cases, totaling \$17,819.14, by the end of the fiscal year.

The Overhead Lines section also performed work for building owners and contractors under work orders amounting to \$28,734.98. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily removing trolley wires and feeders to permit passage of high loads; and shifting of trolley wires and feeders for various excavations.

The Overhead Lines section engaged in many other activities of related nature which it is especially equipped to perform. These additional duties included repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car systems; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.

The Overhead Lines section overhauls the overhead wires in the Twin Peaks and Sunset Tunnels and the rights-of-way annually. Last year, extensive work was done in Twin Peaks Tunnel - 12,000 feet of 4/0 grooved trolley wire was installed to replace worn wires; 2,460 feet of 750 MCM feeder cables were installed to replace damaged cable, and new risers and disconnect switches were installed at five locations in the tunnel. All this work was done during the early morning hours to avoid interruption to streetcar service. While the work was being done, streetcars were single-tracked through the tunnel. The new feeder cable has cross-linked polyethylene insulation with a polyvinyl chloride jacket. This type of cable has many advantages over the paper-insulated lead-jacketed cable formerly used. In addition to being less expensive, it has a higher current rating because its insulation will withstand a higher temperature; it is easier to handle and install because it is much lighter and far more flexible; and it does not require the services of a highly skilled cable splicer -- an ordinary workman can make satisfactory splices.





Left to Right: Seiko Yakahi, Senior Electrical Engineer; Stanley F. Davis, Senior Architect; Wesley F. Getts, Principal Civil Engineer; Robert S. Chin, Senior Draftsman; Rino Bei, Senior Civil Engineer

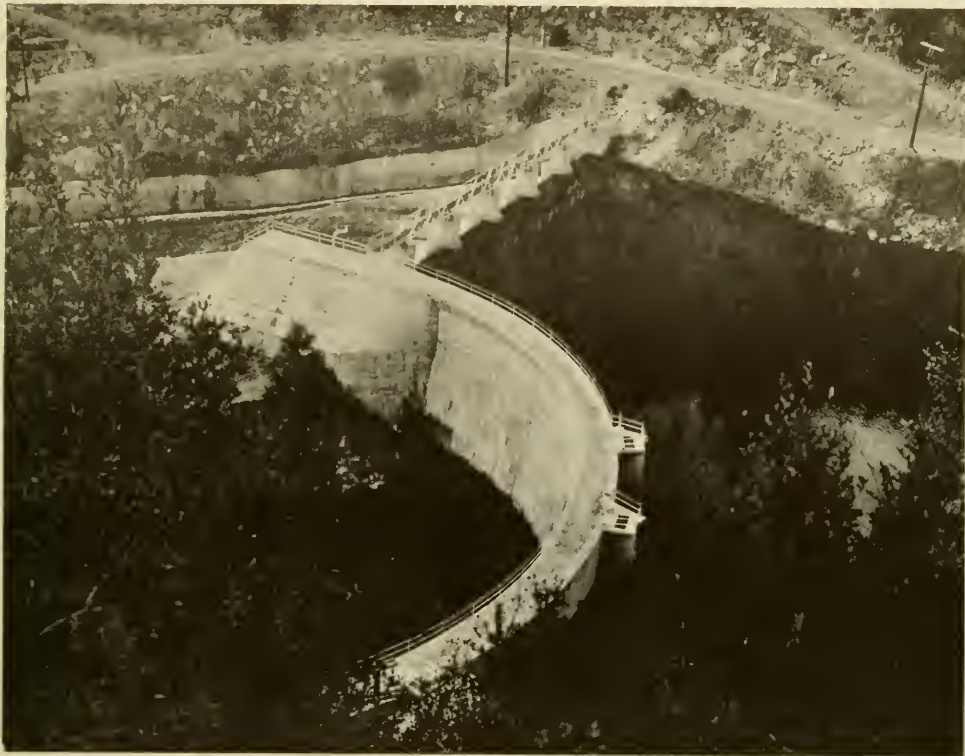
ENGINEERING

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project and the Transit Power Division. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Scheduling of new facilities, construction and major maintenance is done by the Engineering Division. Specifications for procurement of major or unusual items of equipment are also prepared by the Division. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications. Recommendations as to the firms which are so qualified are made by the Engineering Division. Upon approval of a firm by the Public Utilities Commission, the Division prepares the necessary agreements and contracts and reviews and approves the work of the consultants.

The Engineering Division is organized into four main sections:

Structural and Civil, Electrical and Mechanical, Architectural, and Construction

During the year plans and specifications were prepared for the following work:



Intake Dam

HH414 - Repairs to Early Intake Dam

This dam has had minor leakage along the construction joints since it was constructed in 1925. At the request of the State Division of Safety of Dams, these leaks were corrected by pressure grouting with cement mortar. As an additional precaution, the upstream face of the dam was coated with neoprene and the downstream face with silicone.

HH-423 - Moccasin Reservoir Bypass

To protect the quality of the water and to minimize shutdowns of the Hetch Hetchy Aqueduct, a bypass was constructed at Moccasin Reservoir. In times of flood, when the Upper Moccasin Dam is overtopped, it will be possible to supply water directly to the Foothill Tunnel from Moccasin Powerhouse, thus avoiding contamination of the water which would require the aqueduct to be shut down.

HH-426 - Repair of Moccasin Diversion Conduit Liner Plate

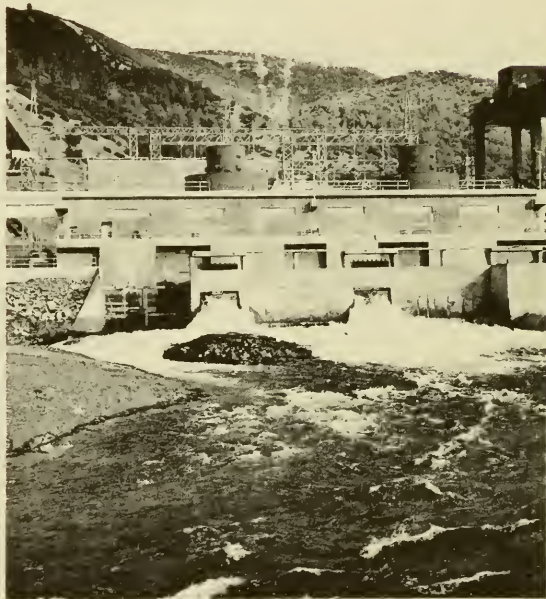
The normal flow (including minor storm flow) of Moccasin Creek is carried through Moccasin Reservoir in 10 ft. diameter concrete conduit. The invert of this conduit is protected from erosion and mechanical damage caused by gravel and rocks carried through it by storm flows by means of steel liner plates. These plates had worn and some had been torn loose over the years. They were replaced by new erosion resistant steel plates laid in an epoxy mortar.

HH-428 - Restoration of Trolley Overhead on Mission and 16th Streets

The overhead wires for the Mission Street trolley coach lines were removed in 1967 to permit the construction of the BART subway along Mission Street. This work was sufficiently completed this year to allow the overhead wires to be replaced and trolley coach service restored to this part of Mission Street.

HH-429 - Construct Three Residences, Early Intake

On May 17, no bids were received for the construction of three houses at Early Intake. Consequently, it was decided to purchase pre-fabricated units for these houses and erect them under the supervision of the Engineering Division. The houses have been ordered and are scheduled for delivery and erection this fall.



Moccasin Reservoir and Powerhouse

HH-430 - Extension of Utilities to Three Residences at Early Intake

This is a companion contract to HH-429 to supply water, power, telephone and sewer service to the houses.

HH-432-R - Repairs to Jones Point-Mather, and Jones Point-Cherry Valley Roads

These roads, about 23 miles long, were patched and a seal coat of asphalt applied to prolong the life of the existing pavement.

HH-433 - Moccasin-Newark Transmission Line, Paint Steel Towers 266N to 458N

This is part of a continuing program to paint about 25 towers per year until all of the towers in need of paint have been painted.

HH-434 - Moccasin Shops and Storage Buildings

Seven of the original buildings in the Moccasin shop area, dating back to the 1920's will be rehabilitated by installing new metal roofing and siding in place of the old corrugated metal. Since these buildings are structurally sound, this work will add years to their life.

HH-435 - Repairs to Dion Holm Powerhouse

Plans were prepared to repair and caulk the walls and the roof flashing at this powerhouse.

HH-436 - Replace Domestic Water System, West Portal and Priest Reservoir

The present water piping is over 35 years old and in poor condition. The pump will also be replaced with a more modern design.

HH-437 - Resurface Roads at Moccasin

Streets and parking areas were patched and resurfaced.

HH-438 - Moccasin Administration Building and Dormitory

New shower facilities will be installed in the Moccasin Dormitory. Both buildings will have their electrical systems upgraded to modern standards and certain areas will receive acoustical treatment and new floor coverings. Interior painting will be done.

HH-440 - Paint Steel Trolley Poles

A survey was made of Municipal Railway trolley poles to determine those most in need of painting. Plans and specifications were prepared for the work.

HH-442 - Motorize Valves, San Joaquin Pipelines

This will provide for operation of six large butterfly valves controlling the flow in the San Joaquin Pipelines by electric motors instead of by hand. It requires two men and several hours time to open or close these valves by hand. With the motor operators one man will be able to do the job in an hour or less.

HH-444 - Bryant Substation Office

Additional office space will be provided at Bryant Substation so that all functions of the Transit Power Division can be headquartered at one location.

HH-446 - Temporary Timber Flume, Moccasin Powerhouse Tailrace

In anticipation of the construction of the Moccasin Reservoir Bypass, a temporary timber flume was designed to pass the water from the powerhouse around the construction area.

HH-449 - Cottage No. 1 O'Shaughnessy Dam, Renovate and Repair

This will include replacement of windows and lighting fixtures and painting.

Repairs to Moccasin Penstock Supports

A number of the concrete saddles supporting the penstocks at Moccasin had settled due to erosion of the hillside over a 45-year period. To avoid shutting down the powerhouse to do this remedial work, a program was worked out with a contractor specializing in foundation grouting to jack the supports back in position and to grout the ground under the support to restore its load carrying capability. This program was successfully carried out and resulted in a considerable saving of money over other methods of reconstruction.

Transmission Lines at Red Mountain Bar

The construction of New Don Pedro Dam will raise the water surface of the reservoir to elevation 830 which is 225 feet higher than the old dam. This will create a body of water 2500 feet wide for our transmission lines to cross instead of the 1000-foot wide reservoir that we now have to contend with. This contract, at the expense of the New Don Pedro Project, relocated two towers to either side of the newly created reservoir with new conductors between. The old towers below the new water level were removed.

Bechtel Corporation was retained to make a study of the power supply and distribution facilities of the Municipal Railway and to prepare recommendations as to the improvements and revisions which will be needed to provide power for the new subway system and cars and to bring the entire power system to modern standards.

The Engineering Division worked closely with Bechtel Corporation to determine operating and design criteria for the new system and to provide basic data on the present system.

Monthly generating schedules were prepared for the optimum operation of Holm, Kirkwood and Moccasin hydroelectric plants. Metering and billing were done for industrial electric power customers of Hetch Hetchy, including the Modesto and Turlock Irrigation Districts.

Numerous meetings and conferences were attended with the Transit Task Force and BARTD to discuss and resolve the many problems of the Municipal Railway power facilities coordination with BARTD and with the Market Street beautification program.

The Construction Section provided field surveys, construction inspection and contract administration for some twenty contracts and projects as tabulated hereinafter.

STREET LIGHTING

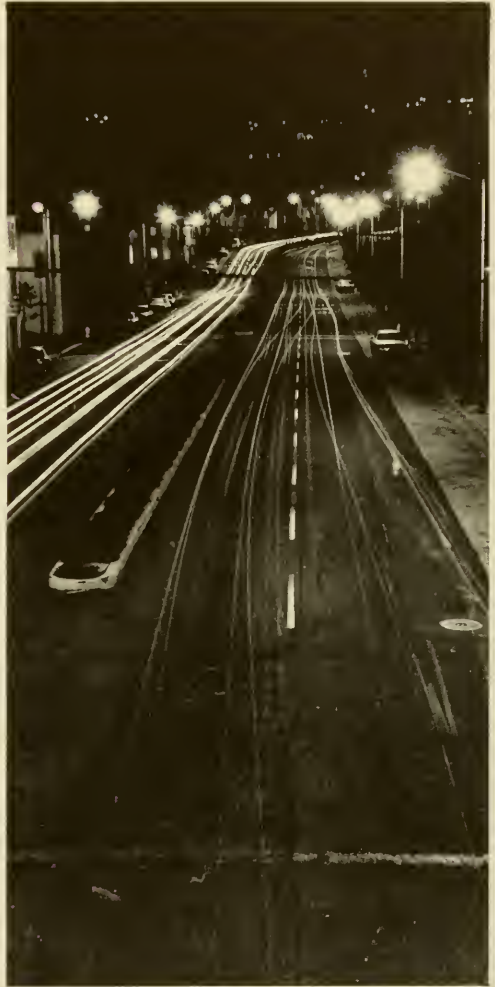
(Bureau of Light, Heat and Power)

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 36.9% owned by the City; 59.8% owned by Pacific Gas and Electric Co.; and a small percentage, 3.3% jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 74.4% of the lights are City-owned. In the past ten years this figure increased from 57.5 percent.

In fiscal 1933-34, the cost for street lighting was \$1.25 per capita; today, with twenty-five times as much light on the streets and public thoroughfares, the cost per capita is approximately \$2.17.

During the fiscal year 1970-71, maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Department. A second contract covered work required for repair of defective and damaged equipment, painting, and miscellaneous maintenance.

Under contract, Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement



Street Lighting on
Bosworth Street

of individual lamps and gloves, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned street light operation was supplied by the Hetch Hetchy power system.

Operation and Maintenance

As of June 30, 1971, a total of 35,852 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and types of units in service at the end of the fiscal year is shown in Appendix Table 11.

A total of \$1,247,176 was expended for operation, maintenance, and repair of the street lighting system. Of the total cost, \$11,925 was paid by the State for its share of operating and maintenance of street lighting at intersections on City streets which are part of the State highway system.

Improvements

During the fiscal year 1970-71, an all time record for street light improvements was established. A total of 1,845 new City-owned electroliers were placed in service at a cost of \$2,040,453. Improvements were financed through the 1964 Street Lighting Bond Issue, and through the Road Fund, as indicated in Appendix Tables 13 and 14.

Contracts now nearing completion will, in the immediate future, add another 1,170 units.

Engineering and contract supervision is performed by the Department of Public Works, subject to approval by the Public Utilities Commission, through the Bureau of Light, Heat and Power.

Damages

During the fiscal year 117 street lights were damaged by vehicles at a cost of \$52,993. Previous experience indicates that 71% of the repair costs will be recovered from the responsible parties.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered from Newark to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments is furnished by Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year, 309,056,306 kilowatthours of electrical energy were consumed through 916 municipal accounts at an expenditure of \$3,322,882. A saving of \$883,298 was realized as a result of purchasing Hetch Hetchy energy, as compared to commercial rates. Additionally, 145,863,339 kilowatthours of energy were supplied to the San Francisco International Airport for resale to tenants for \$1,244,926.

During the past ten years electrical consumption for municipal purposes has increased by 78.8 percent.

Natural gas consumption was 18,019,276 therms through 550 accounts at a cost of \$1,038,506. One account consumed 2,334,000 pounds of steam at a cost of \$4,532.

A summary of consumption and expenditures for these commodities is shown in Appendix Tables 12 and 13.

A P P E N D I X

TABLE 1

HETCH HETCHY WATER AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)

FISCAL YEAR 1970-71

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 621,697	\$ 574,298	\$ -47,399
111	Allowance for Overtime	13,225	10,175	-3,050
112	Allowance for Holidays	5,880	4,642	-1,238
113	Extended Work Week	6,724	3,466	-3,258
120	Temporary Salaries	41,358	35,136	-6,222
130	Wages	993,102	1,001,612	8,510
139	Wages - Gardeners	38,289	33,296	-4,993
200	Contractual Service	53,760	65,093	11,333
216	Maint. and Repair of Auto Equipment	14,000	12,913	-1,087
231-1	Purchase of Power for Resale	700,000	615,353	-84,647
231-2	Service Charge for Transm. and Dist.	2,264,100	2,379,540	115,440
251	Subsistence of Employees	9,500	10,390	890
300	Materials and Supplies	107,600	144,563	36,963
640	Water Rights and Damage Claims	24,000	11,050	12,950
641	Hydrography	12,000	7,245	4,755
801	Accident Compensation	12,000	7,384	4,616
812	Fidelity Insurance	53	72	19
813	Automobile Insurance	5,400	5,028	-372
814	Fire Insurance	10,500	10,382	-118
815	Miscellaneous Insurance	10,500	10,556	56
854	Membership Dues	2,771	3,434	663
855	Fee to U. S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads and Trails - Raker Act	25,000	6,489	-18,511
860	Retirement Allowance	284,138	216,590	-67,548
862	Social Security	77,315	55,433	-21,882
865	Health Service System	26,240	20,876	-5,364
870	Taxes	322,828	382,117	59,289
880	Rentals - Transmission Lines, Offices	122,000	40,500	-81,500
900	Services of Other Departments	586,127	368,552	-217,875
TOTAL OPERATION AND MAINTENANCE		\$ 6,420,107	\$ 6,065,885	\$ -354,222
400	Equipment	56,920	94,074	37,154
500	Additions and Betterments	524,129	524,129	-0-
700	Reconstruction and Replacement	667,711	667,711	-0-
800	Bond Interest and Redemption	9,253,858	8,903,896	349,962
TOTAL		\$16,922,725	\$16,255,695	\$ -667,030

* Includes expenditures, encumbrances, and unencumbered balance allocated for subsequent construction.

TABLE 2
HETCH HETCHY WATER AND POWER
TAXES
FISCAL YEAR 1970-71

<u>Tax Levying Bodies</u>	<u>Assessed Value</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 1,725	\$ 184.94
San Joaquin County	27,600	2,888.86
San Mateo County	2,800	306.50
Stanislaus County	89,290	10,354.32
Tuolumne County	4,383,999 (a)	367,155.52
Banta-Carbona Irrigation District	3,192	151.62
Oakdale Irrigation District	12,320	985.60
West Stanislaus Irrigation District	1,800	90.00
	\$4,522,726	\$382,117.36

(a) Includes \$3,560,000 assessment for water rights.

TABLE 3

TRANSIT POWER DIVISION
MOTIVE POWER SECTION - SUBSTATIONS

<u>Substation</u>	<u>Type (a)</u>	<u>Date Installed</u>	<u>No. of Units</u>	<u>kW Size</u>	<u>Fiscal Year 1970-71</u>	
					<u>Max. Load in kW</u>	<u>kWH Converted to 600 V d-c</u>
Bryant	M-G	1910	3	1500	2400	6,650,200
	M-G	1910	(b) 2	1500		
Turk	M-G	1910	3	1500	3348	9,164,700
	M-G	1910	(b) 2	1500		
Downtown	SC	1921	2	2000	3606	9,808,000
	SC	1924	1	3000		
Eighth Avenue	SC	1921	1	1500	1168	3,101,800
	SC	1921	(b) 1	1500		
	SC	1924	1	2000		
	NAR	1951	1	2000	2744	6,106,000
Outer Mission	NAR	1953	1	750	755	2,374,000
Geneva	M-G	1910	3	1500	1680	<u>512,700</u>
						37,717,400

Notes: (a) Type of Conversion Equipment:

M-G = Motor-Generator

SC = Synchronous Converter

NAR = Mercury Arc Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWERTRANSIT POWER DIVISIONCOMPARISON OF BUDGETED AND ACTUAL EXPENDITURESFISCAL YEAR 1970-71

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110-1	Permanent Salaries	\$ 74,363	\$ 64,884	\$ 9,479
120-1	Temporary Salaries	-0-	2,804	2,804
130-1	Wages - Permanent	567,132	709,351	142,219
130-2	Wages - Temporary	10,000	18,000	8,000
130-3	Wages - Overtime	86,192	163,964	77,772
860-1	Retirement Allowance	87,797	90,992	3,195
862-1	Social Security	20,685	23,400	2,715
865-1	Health Service System	4,060	7,050	2,990
TOTAL OPERATION AND MAINTENANCE -		\$ 850,229	1,080,445	\$ 230,216
400	Equipment	37,080	37,080	-0-
500-1	Additions and Betterments	9,800	9,800	-0-
700-1	Reconstruction and Replacement	1,045,000	1,045,000	-0-
TOTAL		\$ 1,942,109	\$ 2,172,325	\$ 230,216

* Includes expenditures, encumbrances, and unencumbered balance allocated for subsequent construction.

TABLE 5
HETCH HETCHY WATER AND POWER
SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1970-71

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
Revenue from Sale of Electric Energy	\$ 13,583,500	\$ 14,981,938	\$ 1,398,438
Revenue from Sale of Water and Standby Charge, SFWD	4,500,000	4,500,000	-0-
Other Revenue	65,000	134,544	69,544
	<hr/>	<hr/>	<hr/>
TOTAL GROSS REVENUE	\$ 18,148,500	\$ 19,616,482	\$ 1,467,982
<u>EXPENDITURES</u>			
Total Expenditures (From Tables 1-A & B)	\$ 18,864,834	\$ 18,428,020	\$ -436,814
	<hr/>	<hr/>	<hr/>
EXCESS OF REVENUE OVER EXPENDITURES	\$ -716,334	\$ 1,188,462	\$ 1,904,796
	<hr/>	<hr/>	<hr/>

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

	Normal	1966-67	1967-68	1968-69	1969-70	1970-71
SEASON PRECIPITATION (INCHES)						
Hetch Hetchy	34.24	49.02	21.68	56.24	35.07	29.95
Lake Lloyd	47.46	66.69	30.80	76.45	51.94	41.94
Approx. Percent of Normal		142%	64%	16%	106%	88%
WATERSHED RUNOFF (ACRE-FT.) (a)						
Hetch Hetchy	731,731	839,900	758,700	1,157,000	890,200	817,000
Lake Lloyd)	427,666	569,800	385,600	704,300	518,400	439,700
Lake Eleanor)						
Total	1,159,397	1,409,700	1,144,300	1,861,300	1,408,600	1,256,700
Approx. Percent of Normal		122%	99%	161%	121%	108%
RESERVOIR STORAGE (ACRE-FT.) (a)						
Hetch Hetchy	No-Spill					
Lake Lloyd)	Capacity					
Lake Eleanor)	360,360	316,010	293,680	349,575	357,208	356,617
Total	268,800	249,001	197,916	260,921	243,854	199,983
	27,100	26,339	26,339	24,286	27,016	27,403
	656,260	591,350	517,935	633,882	628,078	584,003
DELIVERY TO SFWD (ACRE-FT.) (a) (b)						
Average per day		572	506	563	566	578
Maximum per day		698	861	853	856	748
Total for fiscal year		208,821	185,342	205,426	206,514	210,997

Total since operation of Hetch Hetchy Aqueduct began in 1934

3,672,824

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
(b) Includes delivery to Livermore site, U. S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1970-71

<u>PLANT DATA</u>	<u>Nameplate Rating (Kilowatts)</u>	<u>Capability (Kilowatts)</u>	<u>Annual Plant Factor - %</u>
Moccasin Powerhouse	90,000	104,000	58.4
Dion R. Holm Powerhouse	135,000	150,000	68.0
Robert C. Kirkwood Powerhouse	67,500	85,000	84.8
<u>Total</u>	<u>292,500</u>	<u>339,000</u>	
<u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse	532,100,000		
Dion R. Holm Powerhouse	893,352,000		
Robert C. Kirkwood Powerhouse	<u>631,625,000</u>		2,057,077,000
<u>Station Service</u>			
Moccasin Powerhouse	1,029,000		
Dion R. Holm Powerhouse	1,121,600		
Robert C. Kirkwood Powerhouse	<u>750,900</u>		<u>2,901,700</u>
<u>Net Generation</u>			2,054,175,300
<u>Supplementary Energy</u>			
"Bank" Withdrawal*			133,964,745
Purchase (PG&E Co.)			<u>46,097,953</u>
<u>Total</u>			2,234,237,998
<u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts			458,127,155
Modesto Irrigation District			728,371,000
Turlock Irrigation District			321,456,000
Kaiser Cement and Gypsum Corporation			152,736,000
Kaiser Aluminum and Chemical Corporation			39,549,600
Norris Industries, Inc.			24,033,485
Hercules, Inc.			94,662,000
California Ammonia Company			104,280,480
Air Products and Chemicals Co.			32,653,056
Valley Nitrogen Producers, Inc.			108,631,560
Miscellaneous Customers			754,614
<u>Non-Revenue</u>			
Project Use			4,101,136
"Bank" Deposit*			<u>47,826,652</u>
<u>Losses</u>			
Hetch Hetchy System			40,625,724
PG&E System (Municipal and Industrial Accounts)			<u>76,438,536</u>
<u>Total</u>			<u>2,234,237,998</u>

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1970-71

<u>PLANT DATA</u>	<u>Nameplate Rating</u> <u>(Kilowatts)</u>	<u>Capability</u> <u>(Kilowatts)</u>	<u>Annual Plant</u> <u>Factor - %</u>
Moccasin Powerhouse	90,000	104,000	58.4
Dion R. Holm Powerhouse	135,000	150,000	68.0
Robert C. Kirkwood Powerhouse	67,500	85,000	84.8
<u>Total</u>	<u>292,500</u>	<u>339,000</u>	

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)

<u>Gross Generation</u>		
Moccasin Powerhouse	532,100,000	
Dion R. Holm Powerhouse	893,352,000	
Robert C. Kirkwood Powerhouse	<u>631,625,000</u>	2,057,077,000

<u>Station Service</u>		
Moccasin Powerhouse	1,029,000	
Dion R. Holm Powerhouse	1,121,600	
Robert C. Kirkwood Powerhouse	<u>750,900</u>	<u>2,901,700</u>

<u>Net Generation</u>		2,054,175,300
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<u>Supplementary Energy</u>		
"Bank" Withdrawal*		133,964,745
Purchase (PG&E Co.)		<u>46,097,953</u>

<u>Total</u>		2,234,237,998
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ENERGY DISTRIBUTED (KILOWATT-HOURS)

<u>Sales</u>		
Municipal Accounts		458,127,155
Modesto Irrigation District		728,371,000
Turlock Irrigation District		321,456,000
Kaiser Cement and Gypsum Corporation		152,736,000
Kaiser Aluminum and Chemical Corporation		39,549,600
Norris Industries, Inc.		24,033,485
Hercules, Inc.		94,662,000
California Ammonia Company		104,280,480
Air Products and Chemicals Co.		32,653,956
Valley Nitrogen Producers, Inc.		108,631,560
Miscellaneous Customers		754,614

<u>Non-Revenue</u>		
Project Use		4,101,136
"Bank" Deposit*		47,826,652

<u>Losses</u>		
Hetch Hetchy System		40,625,724
PG&E System (Municipal and Industrial Accounts)		<u>76,438,536</u>

<u>Total</u>		<u>2,234,237,998</u>
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*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 8
HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1969-70 and 1970-71
(Nearest 100,000 Kilowatt hours)

<u>CUSTOMER</u>	<u>1969-70</u>	<u>1970-71</u>
Municipal Accounts		
International Airport	161,700,000	184,500,000
Municipal Railway	66,500,000	64,100,000
Public Works	22,500,000	24,600,000
Street Lighting	43,100,000	43,400,000
Unified School District	30,800,000	34,400,000
Water Department	40,200,000	42,300,000
Other City Departments	62,400,000	64,800,000
Modesto Irrigation District	638,000,000	728,400,000
Turlock Irrigation District	271,200,000	321,500,000
Kaiser Cement and Gypsum Corp.	168,700,000	152,700,000
Kaiser Aluminum and Chemical Corp.	39,200,000	39,500,000
Norris Industries, Inc.	35,700,000	24,000,000
Hercules, Inc.	92,800,000	94,700,000
California Ammonia Company	103,000,000	104,300,000
Air Products and Chemical Co.	34,600,000	32,700,000
Valley Nitrogen Producers, Inc.	124,900,000	108,600,000
Miscellaneous Customers	<u>700,000</u>	<u>700,000</u>
TOTAL	1,936,000,000	2,065,200,000

TABLE 3
HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1969-70 AND 1970-71
(Nearest \$1,000)

<u>CUSTOMER</u>	<u>1969-70</u>	<u>1970-71</u>
Municipal Accounts		
International Airport	\$ 1,322,000	\$ 1,502,000
Municipal Railway	668,000	649,000
Public Works	278,000	299,000
Street Lighting	456,000	459,000
Unified School District	475,000	518,000
Water Department	363,000	372,000
Other City Departments	770,000	808,000
Modesto Irrigation District	3,785,000	4,295,000
Turlock Irrigation District	1,461,000	1,745,000
Kaiser Cement and Gypsum Corp.	1,323,000	1,270,000
Kaiser Aluminum and Chemical Corp.	529,000	342,000
Norris Industries, Inc.	394,000	275,000
Hercules, Inc.	642,000	678,000
California Ammonia Company	705,000	744,000
Air Products and Chemicals Co.	240,000	235,000
Valley Nitrogen Producers, Inc.	871,000	784,000
Miscellaneous Customers	8,000	8,000
	<hr/>	<hr/>
TOTAL	\$ 14,090,000	\$ 14,983,000

TABLE 10

**HETCH HETTY POWER SYSTEM
ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS**

	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71
NET GENERATION						
Moccasin Powerhouse	522,006,700	515,158,600	528,512,500	465,854,212	493,702,900	531,070,800
Lion R. Holm Powerhouse	918,704,430	789,570,220	733,220,320	944,664,850	887,037,320	892,230,400
Early Intake Powerhouse	0	3,000	---	---	---	---
Robert C. Kirkwood Powerhouse		210,829,330	613,159,620	598,681,120	615,542,120	630,874,100
Subtotal	1,440,711,130	1,515,561,150	1,874,892,440	2,009,200,182	1,996,282,340	2,054,175,300
SUPPLEMENTAL ENERGY						
"Bank" Withdrawal*	18,140,548	0	116,276,026	81,906,642	191,365,500	133,964,745
Purchase (PG&E Co.)	233,397,451	255,197,673	0	40,798,879	0	46,097,953
Subtotal	251,537,999	255,197,673	116,276,026	122,705,521	191,365,500	180,062,698
TOTAL	1,692,249,129	1,770,758,823	1,991,168,466	2,131,905,703	2,187,647,840	2,234,237,998
DISTRIBUTION						
Sales						
Municipal Accounts	338,564,327	361,956,735	388,836,371	412,201,831	427,168,499	458,127,155
Modesto Irrigation Dist.	454,291,800	512,112,000	557,184,000	597,864,000	637,972,000	728,371,000
Turlock Irrigation Dist.	173,064,904	206,568,000	248,457,600	263,616,000	271,156,800	321,456,000
Kaiser Cement & Gypsum	163,529,750	149,419,000	175,655,640	173,061,180	168,705,080	152,736,000
Kaiser Aluminum & Chemical	16,968,000	24,600,324	24,334,411	30,744,000	39,240,000	39,549,000
Norris Industries, Inc.	---	27,262,386	60,637,939	35,914,140	35,721,216	24,033,485
Dow Chemical Company	309,582,408	95,705,880	75,829,720	23,582,132	---	---
Hercules, Inc.	138,762,000	112,572,000	112,338,000	7,776,000	92,844,000	94,662,000
Shell Chemical Co.	---	50,346,000	50,570,000	---	---	---
California Ammonia Co.	---	18,992,040	100,845,672	101,720,736	103,020,000	104,280,480
Air Products & Chemicals	---	---	20,762,304	32,930,496	34,617,984	32,653,056
Valley Nitrogen Producers	---	---	---	28,675,920	124,884,480	108,631,560
Miscellaneous Customers	1,294,252	1,045,156	1,046,804	1,016,562	664,093	745,614
Non-Revenue						
Project Use	3,306,403	3,716,688	3,468,127	3,787,748	3,744,004	4,101,136
"Bank" Deposit*	0	110,919,058	60,324,204	205,895,527	135,151,010	47,826,652
Losses	92,885,285	94,543,056	111,877,674	102,119,431	112,758,674	117,064,260
TOTAL	1,692,249,129	1,770,758,823	1,991,168,466	2,131,905,703	2,187,647,840	2,234,237,998

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1970-71

OE	DESCRIPTION	BUDGET	ACTUAL	-UNDER +OVER
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 144,083	\$ 137,363	- 6,720
111	Allowance for Overtime	600	433	- 117
112	Holiday Pay	300	300	0
199	Compensation Reserve		5,674	+ 5,674
200	Contractual Services	1,400	474	- 926
231	Lighting and Heating of			
	Public Buildings - General	1,115,715	1,111,456	- 4,259
231-1	Lighting and Heating of Public			
	Buildings - Special Fund	4,160,987	4,078,261	-82,726
231-2	Lighting of Public Streets -			
	Pacific Gas and Electric Co.	585,188	596,214	+11,026
231-3	Lighting of Public Streets-			
	Hetch Hetchy	435,000	446,881	+11,881
231-4	Lighting of Public Streets -			
	Calif. Division of Highways	1,000	625	- 375
300	Materials and Supplies	675	260	- 415
400	Equipment	0	0	0
813	Auto Insurance	500	444	- 56
860	Retirement Allowance	16,245	13,480	- 2,765
862	Social Security	4,781	2,671	- 2,110
865	Health Service System	1,860	1,284	- 576
954	EDP - PUC Data Processing	9,000	9,000	0
	TOTAL	<u>\$6,477,334</u>	<u>\$6,285,070</u>	<u>-72,464</u>

RECEIPTS

Interfund Receipts*	\$4,270,287	\$4,184,106	-86,181
Ad Valorem Taxes	<u>2,207,047</u>	<u>2,100,964</u>	<u>-106,083</u>
TOTAL	<u>\$6,477,334</u>	<u>\$6,285,070</u>	<u>-192,264</u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

DESCRIPTION	TOTAL FUNDS	EXPENDITURE	-UNDER +OVER
Maintenance and Repair of			
Street Lighting Installations	\$138,000	\$124,282	-\$13,718

*Transfers from other departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1970-71

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION KILOWATT-HOURS	EXPENDITURES
Art Museum	1	722,996	7,967
Auditorium and Brooks Hall	1	4,728,200	51,289
Child Care Centers	9	122,463	3,021
City Planning	1	75,640	1,556
DeYoung Museum	1	2,593,600	25,483
Disaster Corps	2	770	52
Electricity	5	467,616	8,092
Farmers Market	1	11,480	290
Fire (a)	59	2,945,604	60,308
Hassler Health Home	1	719,200	7,873
Health	24	10,860,220	109,133
Hetch Hetchy	6	129,517	3,579
Hidden Valley Ranch	1	945,360	10,844
International Airport (b)	7	184,470,853	1,502,177
Junior College District	12	5,338,175	57,925
Legion of Honor	1	398,400	5,562
Library	31	2,821,523	47,306
Log Cabin Ranch	13	371,410	10,184
Municipal Railway	39	64,085,276	648,802
Parking Authority	19	190,687	4,509
Police	16	915,772	18,334
Public Buildings	9	15,291,103	132,530
Public Works	63	24,358,542	294,035
Purchasing	5	477,336	7,274
Real Estate	2	8,810	234
Recreation and Park	193	10,126,517	171,846
Recreation and Park - Yacht Harbor	35	1,323,279	28,444
Sheriff	3	1,629,120	15,970
Social Services	7	1,229,005	16,366
Street Lighting Operations (.003)	-	43,350,341	446,881
Unified School District	232	29,076,043	460,038
War Memorial	1	1,213,404	16,020
Water	115	42,344,170	371,784
Youth Guidance	3	1,577,213	16,100
TOTAL MUNICIPAL DEPARTMENTS	918	454,919,645	4,561,808
Academy of Sciences	2	2,922,106	26,607
Mount Davidson Cross Lighting		(c)	1,000
State of California: Street Lighting	1	(d)	11,941
Traffic Devices	1	285,404	5,642
TOTAL FROM HETCH HETCHY	922	458,127,155	4,606,998
Fire Dept., For Resale to Fort Mason	1	2,564,066	30,201
GRAND TOTAL	923	460,691,221	4,637,199

- NOTES: (a) Electricity purchased for resale to Fort Mason excluded.
 (b) Includes 145,863,339 KWH resold at Commercial rates for \$1,244,926 to Airport tenants.
 (c) Included under Recreation and Park.
 (d) Included under Street Lighting Operations.

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1970-71

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURE</u>
Auditorium and Brooks Hall	2	1,026	98
Child Care Centers	8	28,185	1,991
City Planning	1	5,576	383
DeYoung Museum	1	281,326	17,996
Disaster Corps	1	387	40
Electricity	2	52,785	3,431
Farmers Market	1	710	62
Fire	59	713,216	45,954
Hassler Health Home	3	278,891	17,960
Health	24	4,113,022	197,844
Hetch Hetchy	2	1,366	140
International Airport	7	1,632,031	82,688
Junior College District	8	730,619	42,101
Library	29	111,880	7,811
Municipal Railway	13	279,205	18,052
Police	10	52,865	3,627
Public Buildings	5	1,433,362	75,967
Public Works	15	598,297	39,657
Purchasing	4	61,496	3,762
Recreation and Park	107	1,398,947	91,807
Registrar of Voters	1	6,934	470
Real Estate	1	1,751	123
Sheriff	2	361,189	19,906
Single Men's Rehabilitation Center	1	37,022	2,367
Social Services	4	71,263	4,654
Unified School District	217	4,555,407	289,434
War Memorial	3	267,221	17,149
Water	13	150,760	10,012
Youth Guidance	4	483,169	25,988
 TOTAL MUNICIPAL DEPARTMENTS	 548	 17,709,908	 1,021,474
 Academy of Sciences	 2	 309,368	 17,032
 GRAND TOTAL	 550	 18,019,276	 1,038,506

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Social Services	1	2,334,000	4,532

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1971

<u>SIZE AND TYPE OF LAMP</u>	<u>COMPANY- OWNED</u>	<u>JOINTLY- OWNED</u>	<u>CITY- OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500 " "	276	24	175	475
4,000 " "	1,323	166	1,900	3,389
6,000 " "	761	371	3,693	4,825
10,000 " "	287	1	565	853
23,000 " Fluorescent	3	---	1	4
400-Watt Mercury Vapor	4	221	161	386
1,000 " "	---	---	3	3
175-Watt Mercury Vapor	---	---	6	6
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	111	111
2,500 " "	17	22	67	106
4,000 " "	193	2	82	277
6,000 " "	43	142	100	285
10,000 " "	93	---	18	111
5,500 " Fluorescent	---	---	38	38
23,000 " "	10	---	2	12
100-Watt Mercury Vapor	---	---	101	101
175 " "	22	---	1,906	1,928
250 " "	31	---	686	717
400 " "	293	221	3,192	3,706
700 " "	---	---	222	222
1,000 " "	---	---	149	149
400 " Lucalox	---	---	21	21
<u>OVERHEAD CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	2	---	---	2
4,000 " "	44	---	42	86
6,000 " "	10	---	---	10
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	18	---	---	18
4,000 " "	78	---	11	89
6,000 " "	5	---	---	5
175-Watt Mercury Vapor	15,026	---	---	15,026
250 " "	2,012	---	---	2,012
400 " "	883	---	---	883
TOTAL, JUNE 30, 1971	<u>21,434</u>	<u>1,192</u>	<u>13,252</u>	<u>35,878</u>
	59.8%	3.3%	36.9%	100%
TOTAL, JUNE 30, 1970	22,301	1,018	12,533	35,852
NET CHANGE DURING THE YEAR	-867	+174	+719	+26

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1970-71

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	\$835,190		
Jointly-owned facilities (a)	67,403		
City-owned facilities (b)	149,014		
Emergency service to City-owned facilities	3,635	1,055,247	
Less deduction for energy component		447,995	607,252

Lease-Lite Corporation

Group lamp replacement - City-owned facilities			37,620
--	--	--	--------

Lease-Lite Corporation

Maintenance and repair - City-owned facilities			
Routine maintenance		20,508	
Repair of damage caused by accidents (c)		32,071	
Repair of damage caused by equipment failure		14,023	
Repair of damage caused by vandals		1,578	68,180

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	13,136		
Damage caused by equipment failure	1,940		
Damage caused by vandals	662		15,735

ELECTRIC ENERGY (METCH METCHY)

47,562,434 KWh @ \$0.01345 less 21% discount			505,375
--	--	--	---------

TOTAL EXPENDITURE

1,234,162

LESS AMOUNT PAID TO METCH METCHY FROM:

Gas Tax Funds for State Highway routes	11,925		
Recreation and Park Dept. for off-street lighting	1,089		13,014

TOTAL NET EXPENDITURE

\$1,247,176

AVERAGE OPERATING COST PER LIGHT

Based on number of lights in service June 30, 1970, average total cost of operation, maintenance and repair per light per year:

\$34.76

- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16

BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS

COMPLETED DURING FISCAL YEAR 1970-71

<u>Location</u>	<u>No. of Lights</u>	<u>Type of Lights (a)</u>	<u>Value</u>
Financed by 1964 Street Lighting Bonds:			
San Jose Ave. - Ocean to Randall	110	M	88,120
California St. - Kearny to Drumm	40	M	45,471
Fulton Street	128	M	138,890
South of Market - Contract 1A	234	M	261,153
Pine St. - Van Ness to Davis	85	M	72,809
Phelan Ave. - Ocean to Flood	14	M	7,535
Jordan Park	38	M	49,332
North of Market - Contract 1	173	M	166,050
South of Market - Contract 1B	157	M	181,963
South of Market - Contract 1C	133	M	166,786
South of Market - Contract 2	127	M	161,470
Pinelake Area	44	M	49,521
Locksley Ave.	6	M	10,406
Gough - Market to Bush	147	M	150,916
TOTAL	1,436		1,550,422
Financed by State Gasoline Tax:			
Pine St. - Gough to Presidio	97	M	98,941
Redevelopment Area D-1 - Contract 1	2	M	3,281
Lake Merced Blvd. at Brotherhood	17	M	12,780
Redevelopment Area E-1 - Contract J	2	M	7,149
Palo Alto - Clarendon to Dellbrook	3	M	2,766
Crestmont Drive	5	I	4,000
23rd St. - Indiana to Iowa	5	M	3,112
Pennsylvania - 22nd to 23rd	11	M	15,827
Judah St. - 44th to LaPlaya	16	M	14,134
Aquatic Park - Stage I	24	M	26,760
Redevelopment Area A-2 - Contract A	44	M	48,490
Pacific, Scott, Broadway	47	M	41,506
Green St. - Pierce to Scott	27	M	85,906
North Waterfront Area - Stage I	5	M	3,800
Aquatic Park - Stage II	26	M	42,956
23rd - Indiana to Iowa	3	M	1,251
Robin Hood Drive	8	M	5,329
Fillmore St. - Lombard to Chestnut	11	M	12,107
Hunters Point Area - Stage I	7	M	6,100
Redevelopment Area A-2 - Contract C	21	M	21,290
Pierce Street - Oak to Fell	3	I	4,034
Duboce Triangle	26	M	26,670
Front Street	1	M	1,842
TOTAL	409		490,031
GRAND TOTAL	1,845		2,040,453

Notes: (a) M - Mercury Vapor

I - Incandescent

TABLE 17

BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to July 1, 1953	\$1,748,675	\$ 617,115	-	\$576,404	\$ 22,650	\$477,651	\$ 3,442,495
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	155,727	30,817	-	748	16,578	543	164,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	538	182,762
1959-60	-	100,126	-	35,874	10,242	4,083	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	474,673	\$ 522,899	-	-	-	997,572
1966-67	-	111,164	188,312	5,000	-	-	304,476
1967-68	-	175,949	331,941	-	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	-	1,031,231
1969-70	-	359,635	261,000	-	-	-	620,635
1970-71	-	490,031	1,550,442	-	-	-	2,040,453
TOTALS	\$2,138,926	\$3,871,959	\$3,471,316	\$878,534	\$197,350	\$498,275	\$11,056,340
LESS:	Cost of portions removed prior to fiscal year 1969-70					825,909	
	Cost of portions removed during fiscal year 1970-71					32,000	
	Original Cost of City-Owned Facilities in Service June 30, 1971						\$87,909
							\$10,198,431

*Includes WPA and PWA (1935-1942), Boulevard Construction (1932-1934), Municipal Transit System, Park and Recreation, and Housing Authority.

TABLE 18
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1970-71

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done during Fiscal Year
HH-399	Red Mountain Bar Wasteway Alterations	OBOD Contractors and Engineers	9-8-69	3-5-71	\$ 63,690	9,487
HH-414	Repairs to Early Intake Dam	Thomas Construction Co.	8-31-70	4-1-71	77,910	83,108
HH-420	Moccasin-Newark Transmission Line - Paint Steel Towers (462N to 763N)	Clinton A. White Painting Company	3-16-70	8-20-70	13,910	5,379
HH-425	Moccasin Reservoir Bypass	Glennville Construction Co.	5-24-71	---	1,028,168	18,000
HH-426	Moccasin Diversion Conduit Repair Invert Liner Plates	Balzell Corporation	10-12-70	10-21-70	37,200	38,739
HH-427	Paint Cottage - Oakdale Yard	John A. Houston	6-12-70	7-29-70	692	346
HH-428	Restoration of Trolley Overhead on Mission & 16th St.	Abbett Electric Corp.	9-28-70	---	109,278	108,017
HH-429	Construct Three Residences Early Intake	Hetch Hetchy Water and Power	6-11-71	---	95,000	1,400
HH-430	Extension of Utilities to Three Residences at Early Intake	City Appliance and Electric	6-28-71	---	21,995	---
HH-432	Seal Coat and Road Repairs Jones Point to Mother Highway 120 to Cherry Dam Moccasin Village Area, & Surfacing John Pownhouse Road	Harold Tower Construction Company	5-17-71	---	91,225	45,965

TABLE J8 (Cont'd)
METRO WATER AND POWER

Contract No.	Description	CONSTRUCTION CONTRACTS FISCAL YEAR 1970 - 71		Original Contract Price	Value of Work Done During Fiscal Year
		Contractor	Contract Time Started Completed		
HEI-435	Pocasin-Nowark Transmission Line - Paint Steel Tower (Towers 266N to 458N)	Clinton A. White Painting Company	9-28-70 ---	\$ 14,750	\$ 14,455
HEI-436	Replace Domestic Water System West Portal and Priest Reservoir	E. H. Morrill Company	5-5-71 6-30-71	15,953	15,953
HEI-437	Resurface Roads Pocasin Village	George Reed, Inc.	10-19-70 11-10-70	33,457	22,685
HEI-442	Motorize Valve - San Joaquin Pipe Line - Oakdale Portal and Tesla Portal Valve Houses	OBCO Contractors and Engineers	6-1-71 ---	28,280	---
HEI-444	Bryant Substation Office	Pedersen Construction Co.	2-22-71 4-24-71	4,449	4,449
HEI-446	Temporary Timber Flume Pocasin Powerhouse Tailrace	Charles I. Cunningham Company	3-1-71 3-30-71	39,933	42,163
HEI-449	Cottage No. 1 O'Shaughnessy Dam Renovate and Repair	Charles I. Cunningham Company	5-3-71 ---	3,888	1,175
HEI-450 HEI-3	Transmission Line Relocation at Red Mountain Bar (115 KV Pocasin-Nowark Line)	Slater Electric Company of California Inc.	3-9-70 7-6-70	135,661	11,127

TABLE 18 (Cont'd)
HETCHETON WATER AND POWER

Contract No.	Description	CONSTRUCTION CONTRACTS FISCAL YEAR 1970 - 71		Original Contract Price	Value of Work Done During Fiscal Year
		Contractor	Contract Time Started Completed		
111-433	Poccasin-Newark Transmission Line - Paint Steel Tower (Towers 266N to 458N)	Clinton A. White Painting Company	9-28-70 ---	\$ 14,750	\$ 14,455
111-436	Replace Domestic Water System West Portal and Priest Reservoir	E. H. Morrill Company	5-5-71 6-30-71	15,953	15,953
111-437	Resurface Roads Poccasin Village	George Reed, Inc.	10-19-70 11-10-70	33,457	22,685
111-442	Motorize Valve - San Joaquin Pipe Line - Oakdale Portal and Tesla Portal Valve Houses	OBCO Contractors and Engineers	6-1-71 ---	28,289	---
111-444	Bryant Substation Office	Nadsen Construction Co.	2-22-71 4-24-71	4,449	4,449
111-446	Temporary Timber Flume Poccasin Powerhouse Tailrace	Charles I. Cunningham Company	3-1-71 3-30-71	39,933	42,163
111-449	Cottage no. 1 O'Shaughnessy Dam Renovate and Repair	Charles I. Cunningham Company	5-3-71 ---	3,888	1,175
111-453	Transmission Line Relocation at Red Mountain Bar (115 N Poccasin-Newark Line)	Slater Electric Company of California Inc.	3-9-70 7-6-70	155,661	11,127

TABLE 18 (Cont'd)
HETCH HETCH WATER AND POWER

Contract No.	Description	CONSTRUCTION CONTRACTS FISCAL YEAR 1970 - 71		Original Contract Price	Value of Work Done During Fiscal Year
		Contractor	Contract Time Started Completed		
HH-433	Pocasin-Newark Transmission Line - Paint Steel Tower (Towers 266N to 458N)	Clinton A. White Painting Company	9-28-70 ---	\$ 14,750	\$ 14,455
HH-436	Replace Domestic Water System West Portal and Priest Reservoir	E. H. Norrill Company	5-5-71 6-30-71	15,953	15,953
HH-437	Resurface Roads Pocasin Village	George Reed, Inc.	10-19-70 11-10-70	33,457	22,385
HH-442	Motorize Valve - San Joaquin Pipe Line - Oakdale Portal and Tesla Portal Valve Houses	OECO Contractors and Engineers	6-1-71 ---	28,289	---
HH-444	Bryant Substation Office	Madson Construction Co.	2-22-71 4-24-71	4,449	4,449
HH-446	Temporary Timber Flume Pocasin Powerhouse Tailrace	Charles I. Cunningham Company	3-1-71 3-30-71	39,935	42,165
HH-449	Cottage No. 1 O'Shaughnessy Dam Renovate and Repair	Charles I. Cunningham Company	5-3-71 ---	3,888	1,175
HH-453	Transmission Line Relocation at Red Mountain Bar (115 KV Pocasin-Newark Line)	Slater Electric Company of California Inc.	3-9-70 7-6-70	155,661	11,127

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS						
FISCAL YEAR 1970 - 71						
Contract No.	Description	Contractor	Contract Started	Contract Completed	Original Contract Price	Value of Work Done during Fiscal Year
Emergency Repairs to Locasin Penstock Supports		Pressure Grout Company	11-2-70	12-16-70	\$ 40,000	\$ 24,047
Emergency Repair Generator No. 2		Hetch Hetchy Water and Power	2-19-71	3-31-71	110,000	110,203
Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year						<u>\$ 546,961</u>
Value of City Furnished Material						<u>\$ 18,787</u>
Contract No. III-428 - Restoration of Trolley Overhead on Mission & 16th Streets						<u>\$ 565,748</u>

1971 ANNUAL REPORT 1972

HETCH HETCHY WATER AND POWER



PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO

CITY AND COUNTY OF SAN FRANCISCO

JOSEPH L. ALIOTO - MAYOR

PUBLIC UTILITIES COMMISSION

MARVIN E. CARDOZA	President
OLIVER M. ROUSSEAU	Vice President
JOSEPH J. DIVINY	Commissioner
H. WELTON FLYNN	Commissioner
LOUIS A. PETRI	Commissioner
JOHN D. CROWLEY	General Manager

HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to Hetch Hetchy employees, past and present, whose devoted and conscientious efforts have made possible these accomplishments for San Francisco.

HIGHLIGHTS - 1971-72

Hetch Hetchy power revenues were \$14,502,230, slightly less than the preceding year. Revenue for sale of water and standby service to the San Francisco Water Department was \$5 million, an increase of half a million dollars.

\$4.06 million in Hetch Hetchy power revenues were appropriated this year for the operation, maintenance and improvement of the electrical facilities of the San Francisco Municipal Railway, thus sparing City taxpayers the payment of this amount as an additional subsidy.

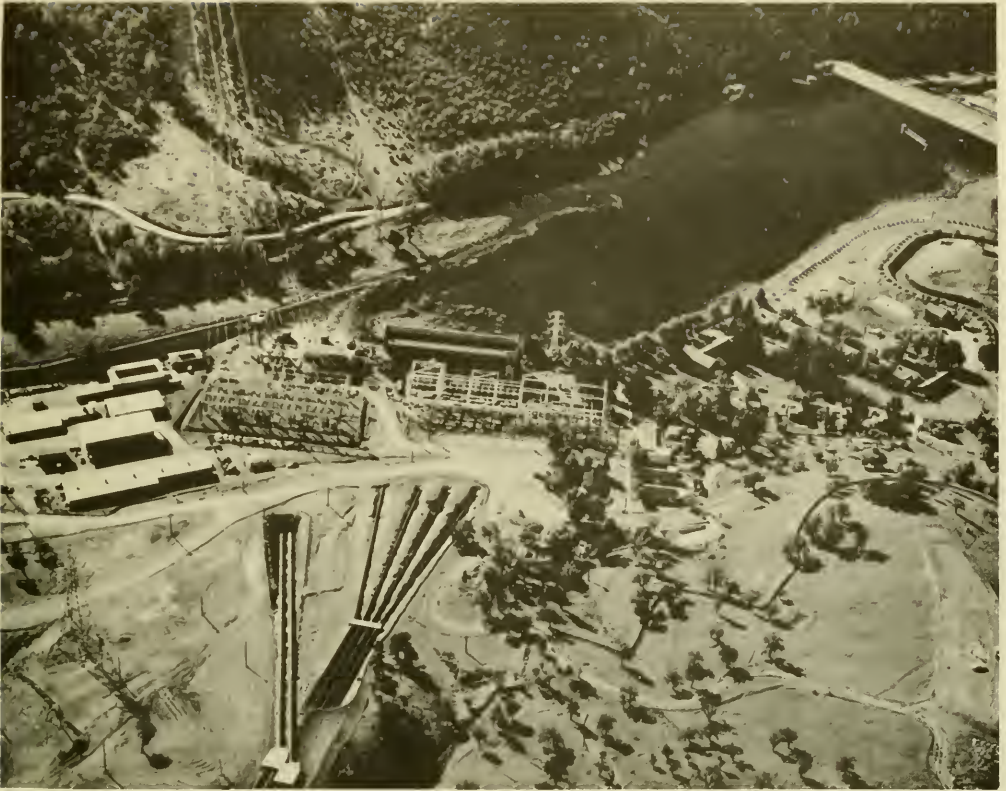
Hetch Hetchy furnished power to the Municipal Railway and all other municipal departments at rates well below those which would have been charged by the Pacific Gas and Electric Company, a further saving to the taxpayers of \$935,000. During the past ten years, electrical consumption for municipal purposes has increased 78.2%.

Recreational facilities at new Don Pedro Dam, designed to accommodate more than one-half million recreational users annually, became fully operational this spring.

An all-time record of street lighting improvements was again established. A total of 2,050 new City-owned electroliers were placed in service at a cost exceeding \$2,350,000. The cost per capita of street lighting, even with more and better lighting, fell still further to \$1.83



GRAND CANYON OF THE TUOLUMNE



MOCCASIN POWERHOUSE AND RESERVOIR

ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, the HETCH HETCHY WATER AND POWER DEPARTMENT and BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. Approximately three-fourths of the water consumed in San Francisco, and the Water Department service area, comes from this source. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.

Through its Transit Power Division, Hetch Hetchy has operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Railway since July 1, 1969. At that time, the Public Utilities Commission decided to transfer the responsibility for the conversion and distribution of electrical power to streetcars and trolley buses in San Francisco from the Municipal Railway to Hetch Hetchy Water and Power. Now, Hetch Hetchy not only generates and transmits the electrical power from the Sierra Nevada to the Bay Area, as it has in the past, but distributes this power directly to the transit vehicle.

In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Overhead Lines and Motive Power Sections of the Municipal Railway. Personnel for this division includes fifty-one employees in twelve different categories. Last year, this responsibility cost Hetch Hetchy, and saved San Francisco taxpayers, \$4.06 million.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design, and construction of City-owned street lighting improvements are under the jurisdiction of Department of Public Works. In accordance with provisions of the City and County Administrative Code, plans for these improvements must be approved by the Public Utilities Commission through this Bureau. The Bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1971-72, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>No. of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	194	\$ 16,547,137
Hetch Hetchy Water and Power (Transit Power Division)	51	4,132,355
Bureau of Light, Heat and Power	<u>12</u>	<u>6,620,515</u>
TOTAL	257	\$ 27,300,007

HETCH HETCHY WATER AND POWER SYSTEM

REVENUES AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and five industrial customers:

Kaiser Cement and Gypsum Corporation	Santa Clara County
Kaiser Aluminum and Chemical Corporation	Santa Clara County
Hercules, Inc.	Contra Costa County
California Ammonia Company	San Joaquin County
Norris Industries, Riverbank	Stanislaus County

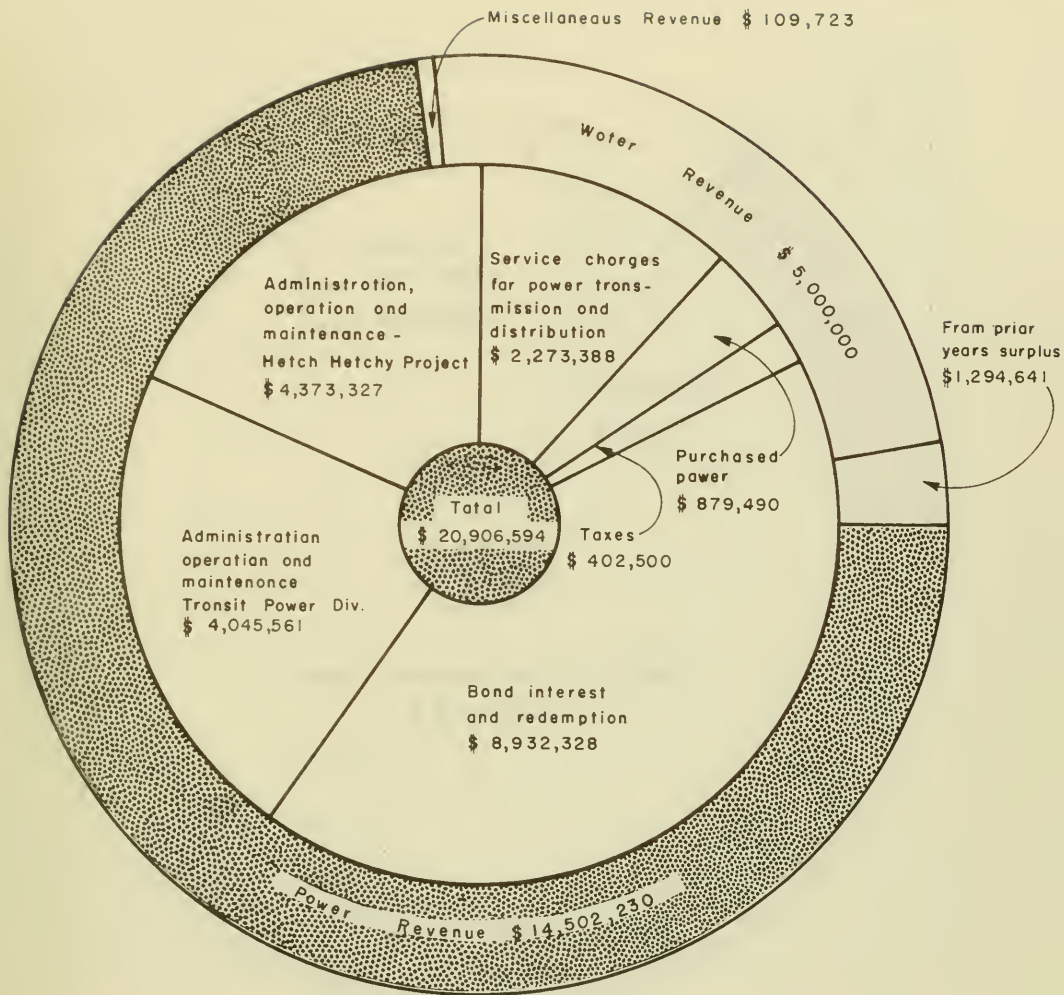
2. Sale of Water to the San Francisco Water Department.

This past year, revenue from sale of water and standby service to the San Francisco Water Department was \$5 million.

Gross sales of electric energy amounted to \$14,502,230, compared to \$14,983,000 during the year 1970-71. This decrease in electric revenue reflected the decrease in actual sales during the year; 1,978,800,000 kilowatthours, as compared to 2,065,245,250 kilowatthours for 1970-71.

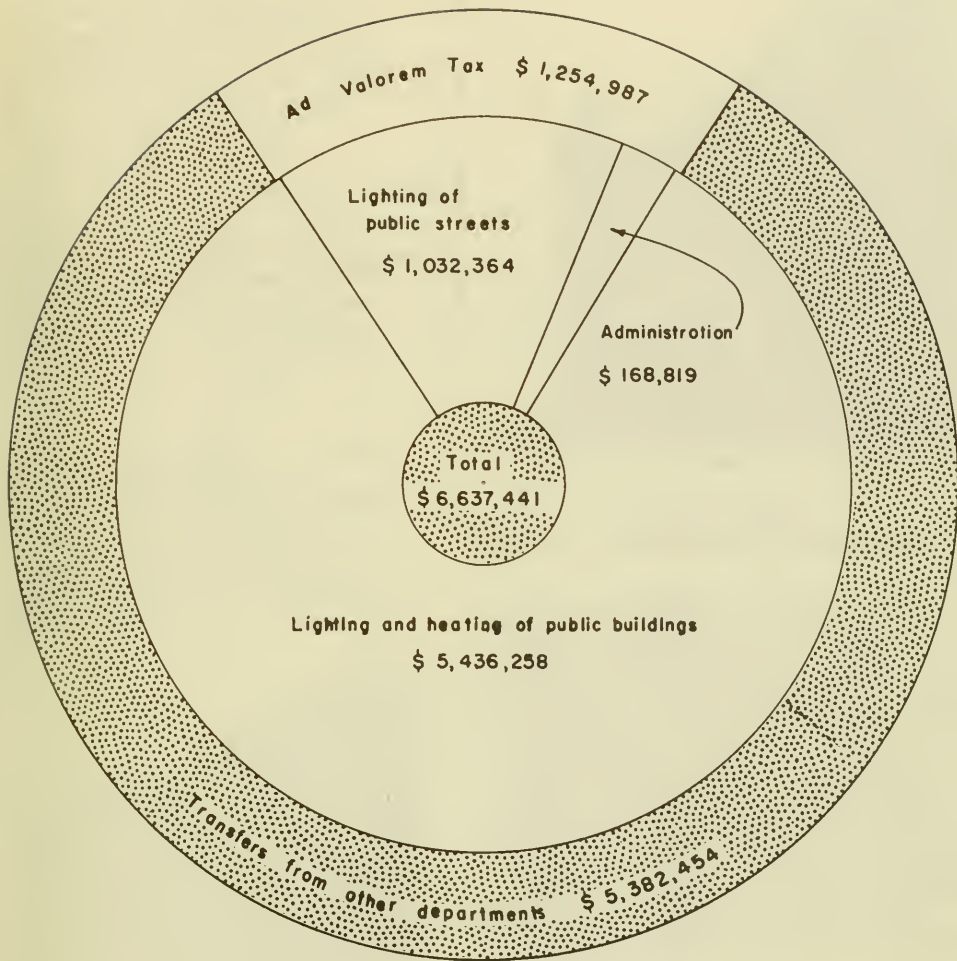
Revenue for service orders, rentals, meals and miscellaneous items totaled \$109,723.

Expenditures are summarized on the pie chart following, and are detailed in the appendix.



HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1971-72





BUREAU OF LIGHT, HEAT AND POWER
REVENUES AND EXPENDITURES
FISCAL YEAR 1971-72

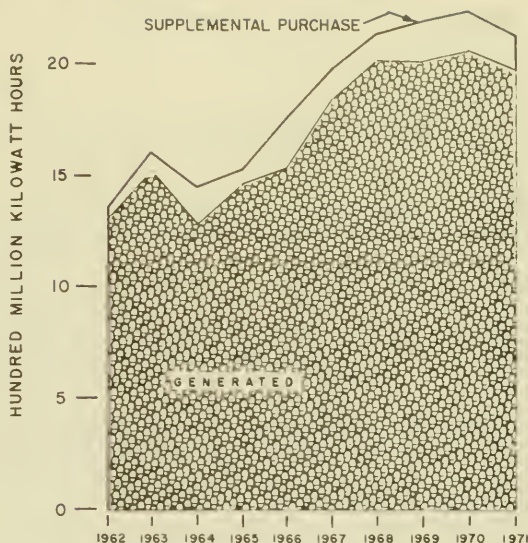


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POWER SALES

Power and energy delivered to all City Departments increased 4.4% over the previous year, nearly three-quarters of which is accounted for by the San Francisco International Airport. Although the increase was not as spectacular as the 14.1% for 1970-71, the 8.3% increase by the Airport for 1971-72 indicates that its facilities are still undergoing expansion to meet the ever changing requirements of the new and larger jet liners.

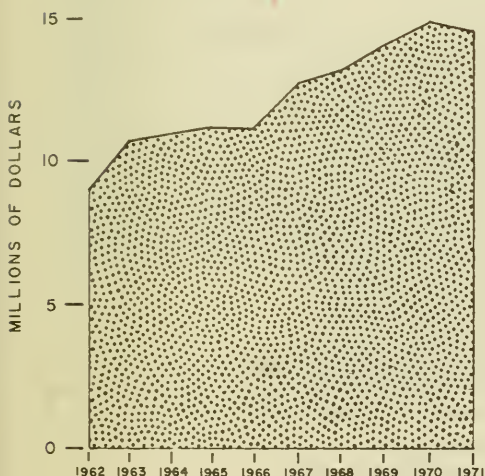
Hetch Hetchy power is sold to City Departments at cost, representing a saving to taxpayers for 1971-72 of approximately \$935,000, compared to the cost if supplied by local investor-owned utility.



HETCH HETCHY
ENERGY GENERATION AND PURCHASE

Power and energy delivered to Modesto Irrigation District, Hetch Hetchy's largest power customer, and to Turlock Irrigation District, the third largest, increased by 9.4% and 12.2% respectively this year. These increases mark the steady load growths which the two Districts are still experiencing. However, these increases would have been on a smaller scale had the impounding of water at the Districts' new Don Pedro Reservoir met with more favorable water conditions the past year.

Gross sales of electric energy amounted to \$14,502,230 compared to \$14,983,447 during 1970-71. This decrease in electric revenue is related to a 4.7% decline in total generation at the Hetch Hetchy powerhouses resulting from



REVENUE FROM SALE OF ELECTRIC ENERGY

the subnormal precipitation on the Tuolumne River watershed this past fiscal year. This decrease in generation also accounted for the increase in expenditure for supplementary power and energy from \$573,059 to \$879,490.

WATER PRODUCTION AND TRANSMISSION

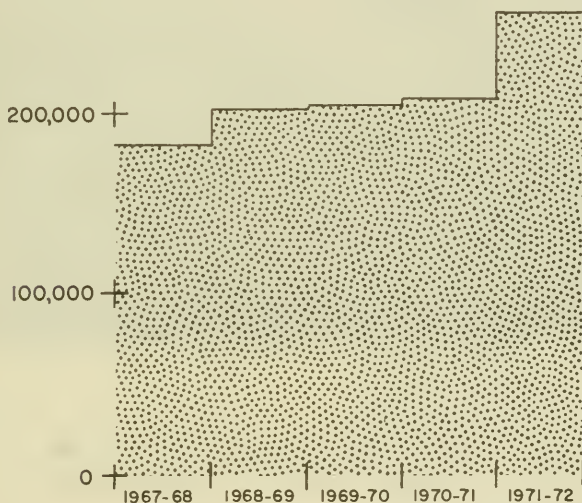
Precipitation recorded for the year at our measuring stations was 71 percent of average.

During the year, 83,527,100,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 89 percent of the City's total customer consumption. In addition, 229,700,000 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 43,736,308 gallons were delivered to Groveland Community Service District in Tuolumne County.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.

Acre Feet
Delivered
To SFWD

300,000 +



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT



HEADQUARTERS - VISITORS CENTER - LAKE DON PEDRO

DON PEDRO RECREATIONAL FACILITIES

The new Don Pedro Dam, completed in 1971 by the three constructing agencies, the City and County of San Francisco and the Turlock and Modesto Irrigation Districts, not only will provide the many benefits stemming from the irrigation, flood control and power aspects of the project, but will provide tremendous recreational benefits for all the people of California.

Outdoor recreation is a new activity in the agencies' portfolio of meeting agricultural, community and metropolitan needs for water and power. The inclusion of an outdoor public recreation program through the cooperative efforts of the three agencies, the State of California (through the Davis-Grunsky Act which provided for the recreation facilities and boat-launching ramps), and the Federal Government, as well as Tuolumne County, is a noteworthy accomplishment.

Hetch Hetchy, under terms of the agreement with Turlock and Modesto Irrigation Districts, provides financial support for the recreational facilities by means of an annual assessment which is established at 51.7121% of the deficit (the difference between operating costs and revenue) which occurs from the recreational operation of the Don Pedro Project. For fiscal year 1971-72, this assessment was \$17,982.68. It is estimated that the assessment for Hetch Hetchy for 1972-73 will be \$50,000. Although the total gate receipts of the Don Pedro Recreation Agency (the agency which was created by the aforementioned agencies to manage the recreational facilities) are still small, the increase from June 1971 to June 1972 was almost 500%. Indications are that this trend of rapidly increasing receipts will continue for many years, as the lake rises and the public becomes more aware of the new facilities. This should result in a decrease in and, it is hoped, the eventual elimination of the annual assessment altogether.



BOAT LAUNCHING RAMP, FLEMING MEADOWS
LAKE DON PEDRO

Currently, there are three highly developed recreational areas on the lake containing nearly 630 camping, picnicking and trailer spots, complete with modern sewage treatment facilities.

On the east side of the dam, at Fleming Meadows which is located just north of La Grange, there are 130 picnic units, 125 tent camp units, 90 trailer units with hookups, a fish cleaning station, a boat launching ramp, a trailer sewage disposal station and various other recreational facilities, including a completely treated two-acre swimming lagoon and a group picnic facility.



CAMPING SPOT - LAKE DON PEDRO

The Lake Don Pedro Marina, Inc., a corporation made up of Turlock business and professional people, now in operation at Fleming Meadows, has 150 open and covered slips now in use with more planned for the future.

Buoyed cables provide tie-up and services for nearly 100 houseboats. In addition to gas, oil, water, telephone and sewage pump-out services, there are concession snack bars and stores supplied with the varieties of goods and other services needed by those using the camping, fishing and boating facilities. Houseboats, along with boats for fishing and water skiing, are available for rental.

The second area near the dam is called Mexican Gulch and is located on the western shore of the lake off of County Road J-59. It contains 187 tent camp units, a trailer sewage disposal station, and a fish cleaning station.

The Moccasin Point area on Yosemite Highway No. 120 has 20 picnic units, 62 tent camp units, 13 trailer units with hookups, a trailer sewage disposal station, a boat-launching ramp and a fish cleaning station. This is a convenient overnight camping place for tourists visiting historic places along the Mother Lode Highway No. 49, or going to the Stanislaus National Forest and Yosemite National Park.

The Headquarters-Visitors Center which is situated on the west side of the dam provides an outstanding overlook of the lake, the dam, and the San Joaquin Valley, as well as the adjacent foothill and mountainous country.

The lake offers excellent fishing opportunities, as it is well stocked with many varieties of fish. These include black bass, rainbow and eastern brook trout, Kokanee salmon, crappie and catfish. Since the completion of the new reservoir, almost one million fingerling trout have been stocked in the main Tuolumne River at the headwaters of the lake. Also, about 25,000 silver salmon are scheduled for planting in 1973. With the tremendous increase in shore line and additional food areas, the deeper and colder water, along with the many warm water inlets and coves, this lake should offer excellent fishing waters in the years ahead.

Don Pedro is located in a section of the Mother Lode Country rich in history and traditions associated with the early gold rush days of California. Visitors to the lake and campgrounds are within easy reach of such interesting historic communities as Columbia, Sonora, Jamestown, Knight's Ferry, Chinese Camp, Coulterville and La Grange.

The lake is readily accessible to millions of people within two hours or so driving time. It is less than an hour from Modesto, Turlock, Merced, Oakdale and Sonora, an hour from Stockton, and a little over two hours from Sacramento, Fresno and the San Francisco Bay Area communities. Approximately 40% of the visitors come from adjacent San Joaquin Counties, 40% from the San Francisco Bay Area and Coastal Counties, and the balance from adjacent mountain counties and Southern California.



MARINA - FLEMING MEADOWS
LAKE DON PEDRO



TRANSIT POWER DIVISION

The Transit Power Division is responsible for supplying the 600-volt direct current power that is necessary to operate the streetcars and trolley coaches of the San Francisco Municipal Railway.

The Transit Power Division is composed of two sections - the Motive Power Section and the Overhead Lines Section.

Motive Power Section

The Motive Power Section operates and maintains seven substations which convert electric power from 12,000 volts alternating current to 600 volts direct current by means of motor-generators, synchronous converters, and mercury arc rectifiers. (See Appendix Table 3 for statistical data.) Motive Power is also responsible for maintaining the electric motors and associated control equipment for operating the cable-winding machinery located in the Cable Car Powerhouse at Washington and Mason Streets. In addition, Motive Power is also responsible for periodic inspection, cleaning, adjusting and repairing the streetcar and trolley coach recorders at Central Control of the Municipal Railway.

The substations operate 24 hours per day, 7 days per week, 365 days per year.

The insulation of all the motor-generators and synchronous converters in the manually-operated substations has deteriorated to the point that it is very dry and brittle. Since March 1972, four machines have been removed from service for inspection and cleaning, and then the insulation was spray-painted with clear Glyptal, in hopes of prolonging the life of the machines until they can be replaced with modern rectifier substations.

Overhead Lines Section

The primary function of the Overhead Lines Section is to maintain, in satisfactory operating condition, the trolley wire overhead facilities and the electric distribution system which conveys power to it.

Overhead facilities are systematically inspected, and worn or damaged parts are replaced before they can cause accidents or malfunctioning of equipment. Also, damaged trolley support poles were straightened and reinforced to avoid costly replacement. Trolley support poles, which were needed to support street lights, were extended and/or relocated for more efficient street light coverage.

The Overhead Lines Section repaired 15 cases of damage to the trolley overhead facilities and/or the electric distribution system, and the parties responsible for the damage were billed a total of \$10,069.41. The City was reimbursed for 11 of the cases, totaling \$9,195.45, by the end of the fiscal year.

The Overhead Lines Section also performed work for building owners and contractors under work orders amounting to \$30,974.98. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily removing trolley wires and feeders to permit passage of high loads; and shifting of trolley wires and feeders for various excavations.



The Overhead Lines Section engaged in many other activities of a related nature which it is especially equipped to perform. These additional duties included repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car system; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.



ENGINEERING

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project and the Transit Power Division. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Scheduling of new facilities, construction and major maintenance is done by the Engineering Division. Specifications for procurement of major or unusual items of equipment are also prepared by the Division. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications. Recommendations as to the firms which are so qualified are made by the Engineering Division. Upon approval of a firm by the Public Utilities Commission, the Division prepares the necessary agreements and contracts and reviews and approves the work of the consultants.

The Engineering Division is organized into four main sections: Structural and Civil, Electrical and Mechanical, Architectural and Construction.

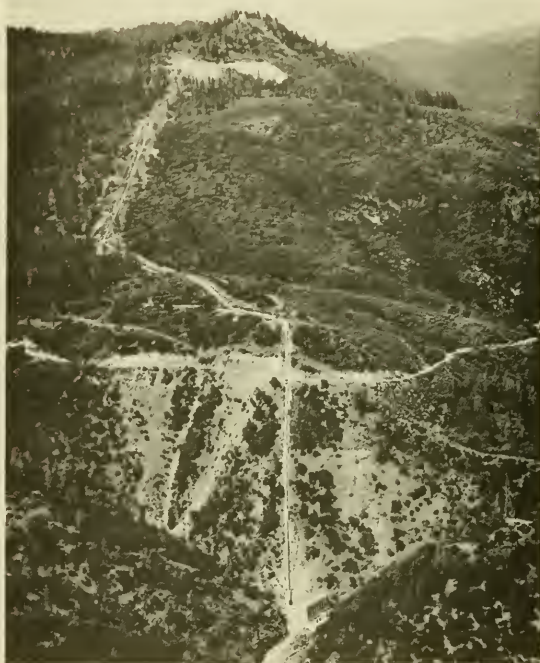
During the year, plans and specifications were prepared for the following work:

HH-424 - Powerhouse Flow
Meter Plumbing

Plans and specifications were prepared to correct flow meter problems in Kirkwood and Moccasin Powerhouses. Bids for this project came in too high; therefore, the bids were rejected and the work was done by City forces at Moccasin.

HH-431 - Repairs to Dion R.
Holm Penstock

To protect the penstock, rock slides in the penstock ditch were removed, concrete trench lining was repaired, and the steel penstock was painted where required.



DION HOLM PENSTOCK AND POWERHOUSE

HH-439 - Clearing Transmission Lines - Rights-of-Way

Tall and fast-growing vegetation was removed. Bushes eight feet high and under were allowed to remain to cushion possible fall of conductors and to help prevent fire.

HH-441 - Additions to Truck Port and Washing Facilities - Moccasin

Moccasin shop facilities were improved to eliminate open storage of vehicles and to provide capability for daily washing of automatic equipment.

HH-445 (Inf.) - Outer Mission Substation Car Guard - Repair, Paint

A guard was erected to eliminate vandalism, unauthorized parking of cars, and resultant damage to buildings. The exterior of the substation was repaired and painted.

HH-447 - Installation of Post Street Trolley System

A contract was started to install overhead trolley wires to accommodate new one-way street patterns.

HH-452 - Improvements to Storm Drainage System at Moccasin

A contract was let for work to prevent storm runoff around the Moccasin shops and powerhouse from entering the San Francisco water supply.

HH-453 - Holm Powerhouse - Paint Interior

A contract was let to paint the interior of Holm Powerhouse as part of a program of preventive maintenance.

HH-454 - Reconstruct Disposal Field - Moccasin

The existing sewage disposal facilities at Moccasin are in very poor condition, and the existing bypass system diverts raw sewage directly into Moccasin Creek. Application was made for a Clean Water Grant, enabling installation of a modern treatment plant.

HH-455 and HH-465 - Moccasin-Newark Transmission Line -
Paint Steel Towers

These are part of a continuing program of preventive maintenance to paint about 25 steel towers per year.

HH-456 - Resurface Mather-Hetch Hetchy Road

The road between Mather and Hetch Hetchy was resurfaced to prolong the life of the existing pavement.

HH-457 - Cottage No. 4, O'Shaughnessy Dam - Renovate and Repair

Work done on Cottage No. 4 at O'Shaughnessy Dam included remodeling of the bathroom, insulation of ceilings and painting of the interior.

HH-458 - Relocation of Moccasin-Newark
Transmission Line
Tower No. 970 in
Fremont

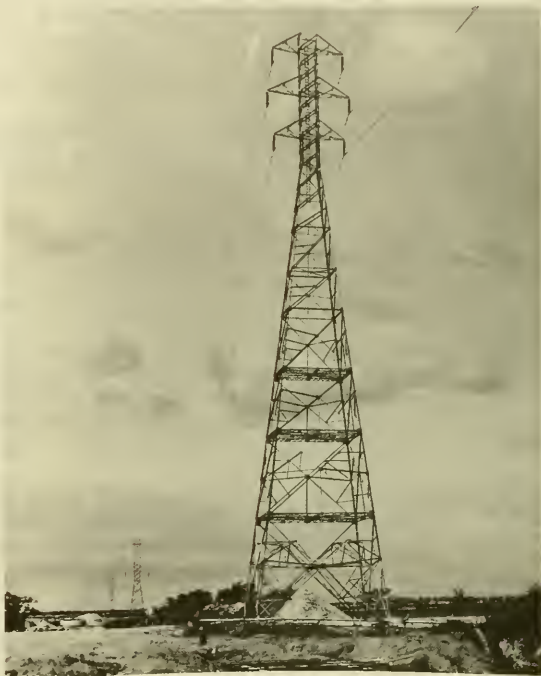
Relocation of Moccasin-Newark Transmission Line, Tower No. 970 in Fremont, was necessitated by conversion of two-lane Durham Road into a four-lane expressway. Work was done at the expense of the City of Fremont.

HH-459 - Replacement of Electric
Substation - Alameda
Portal

Obsolete small transformers were replaced with new larger units suitable for current needs.

HH-460 - Moccasin Dam Area
Roadway Lighting

A contract was let to replace existing roadway lighting fixtures with improved luminaires and to install underground wiring in place of present overhead wires.



MOCCASIN-NEWARK TRANSMISSION LINE TOWER

HH-461 - Improvements to Domestic Water Supply System at Moccasin

A contract was started to install a more dependable water system using water from the cooling water sump in the powerhouse rather than from the high pressure penstocks. Chlorination will be added. The new Don Pedro Project provides funds for extension of the water supply to the recreation area.

HH-462 (Inf.) - Install Heating System in Tesla Portal Residence

A contract was let for installation of a new central heating system in Tesla Portal residence. Construction of additional rooms made the old floor furnace inadequate.

HH-463 - Install Underground Feeder Cables - Mission Street - Second to Fourth Street

Plans and specifications were completed for a contract to underground overhead trolley feeder cables on Mission Street in the vicinity of the proposed Yerba Buena Center to make way for sewer relocation and to eliminate overhead feeder cables in front of new improvements.

HH-464 - Replace, Repair and Paint Steel Trolley Poles

Plans and specifications were completed for a contract to replace, repair and paint steel trolley poles on California Street as part of a continuing program of preventive maintenance.

The Engineering Division worked closely with Bechtel Corporation to determine operating and design criteria for the new system and to provide basic data on present system.

Monthly generating schedules were prepared for the optimum operation of Holm, Kirkwood and Moccasin hydroelectric plants. Metering and billing were done for industrial electric power customers of Hetch Hetchy, including the Modesto and Turlock Irrigation Districts.

Numerous meetings and conferences were attended with the Transit Task Force and BARTD to discuss and resolve the many problems of the Municipal Railway power facilities coordination with BARTD and with the Market Street beautification program.

The Construction Section provided field surveys, construction inspection and contract administration for some eighteen contracts and projects as tabulated hereinafter.

STREET LIGHTING

(Bureau of Light, Heat and Power)

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 39.9% owned by the City; 57.5% owned by the Pacific Gas and Electric Company; and a small percentage, 2.6%, jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 78.3% of the lights are City-owned. Five years ago, the corresponding figure was 65.6%.

The cost to install street lights has increased by only 38% in the last twenty-five years. The average cost to install a street light in 1947 was \$831; the average cost for the fiscal year 1971-72 was \$1,147.

During fiscal 1933-34, the cost for street lighting was \$1.25 per capita; last year, with almost thirty times as much light on the streets and public thoroughfares, the cost per capita was approximately \$1.83.

Maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Bureau. A second contract covered work required for repair of damaged and defective equipment, painting, and miscellaneous maintenance.

Under contract, the Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing,



LINCOLN WAY - STREET LIGHTING

maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned street light operation was supplied by the Hetch Hetchy power system.

Engineering

The Bureau reviews, recommends changes, approvals or rejections of and correlates all street lighting installations, including that done by the Department of Public Works, the Pacific Gas and Electric Company, the Bay Area Rapid Transit District, the State of California, subdividers, etc.

During the fiscal year 1971-72, 26 street lighting contracts involving a total of 912 new street lights, were approved by the Public Utilities Commission. Plans were submitted for approval only after careful checking to determine that illumination will exceed the minimum requirements established by the American National Standards Institute; and that all materials used, and manner of installation meet with the applicable local, state and federal rules, regulations and statutes governing the installation of electrical work.

Operation and Maintenance

As of June 30, 1972, a total of 36,592 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and types of units in service at the end of the fiscal year is shown in Appendix Table 14.

A total of \$1,185,958 was expended for operation, maintenance and repair of the street lighting system. Of the total cost, \$12,128 was paid by the State for its share of the operation and maintenance of street lighting at intersections on City streets which are part of the State highway system.

During the fiscal year, there were 110 accidents involving damage to City-owned street lighting property. Investigation was made, as soon as possible, to remove hazards to the public and obstructions to traffic. Total cost of repairs to damaged City-owned street lighting property was \$43,410. Every effort was made to secure reimbursement for damages incurred from responsible parties. Previous experience indicates that approximately three-fourths of the repair costs will be recovered.

Complaints

During the year, 101 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and requests for temporary and permanent relocation of street lighting poles.

Improvements

During fiscal year 1971-72, an all-time record for street lighting improvements was established. A total of 2,050 new City-owned electroliers were placed in service at a cost of \$2,351,545. Improvements were financed through the 1964 Street Lighting Bond Issue and through the Road Fund, as indicated in Appendix Tables 16 and 17.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments are furnished by the Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year, 478,105,789 kilowatthours of electrical energy was consumed through 921 municipal accounts at an expenditure of \$4,801,078. A saving of \$1,276,236 was realized as a result of purchasing Hetch Hetchy energy as compared to commercial rates. Of the above 160,587,573 kilowatthours of energy was supplied to the San Francisco International Airport for resale to tenants at a cost of \$1,373,166.

During the past ten years, electrical consumption for municipal purposes has increased by 78.2 percent.

Natural gas consumption was 20,195,971 therms through 543 accounts at a cost of \$1,118,001. One account consumed 2,389,700 lbs. of steam at a cost of \$4,241.

A summary of consumption and expenditures for these commodities is shown in Tables 12 and 13.



Bob Mims Bob Moulton



Ardean Heyer
Agnes Hughes



Blaire Froehle



Richard Szeto



Robert Collins

AT WORK



Anne Wilson Ronald Ciraulo



Lonnie Lawson

A P P E N D I X

TABLE 1HETCH HETCHY WATER AND POWERCOMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)FISCAL YEAR 1971-72

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 660,401	\$ 582,008	\$ -78,393
111	Allowance for Overtime	14,628	21,562	6,934
112	Allowance for Holidays	6,128	3,960	-2,168
113	Extended Work Week	6,102	2,127	-3,975
120	Temporary Salaries	43,152	48,099	4,947
130	Wages	1,079,945	1,092,228	12,283
139	Wages - Gardeners	44,252	39,547	-4,705
200	Contractual Service	54,985	63,532	8,547
216	Maint. and Repair of Auto Equipment	14,700	10,087	-4,613
231-1	Purchase of Power for Resale	500,000	879,490	379,490
231-2	Service Charge for Transm. and Dist.	2,264,100	2,273,388	9,288
251	Subsistence of Employees	9,500	8,370	-1,130
300	Materials and Supplies	107,600	130,588	22,988
640	Water Rights and Damage Claims	24,000	12,128	-11,872
641	Hydrography	21,000	19,386	-1,614
801	Accident Compensation	12,000	31,620	19,620
812	Fidelity Insurance	53	72	19
813	Automobile Insurance	5,400	5,028	-372
814	Fire Insurance	10,500	10,382	-118
815	Miscellaneous Insurance	10,500	12,701	2,201
853	Assessments Paid to Other Districts	1,091	13,852	12,761
854	Membership Dues	351	412	61
855	Fee to U. S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads and Trails - Raker Act	25,000	12,500	-12,500
860	Retirement Allowance	325,471	305,851	-19,620
862	Social Security	78,687	78,687	-0-
865	Health Service System	26,331	26,331	-0-
870	Taxes	382,123	402,500	20,377
880	Rentals - Transmission Lines, Offices	122,400	122,400	-0-
900	Services of Other Departments	708,865	708,865	-0-
	TOTAL OPERATION AND MAINTENANCE	\$ 6,589,265	\$ 6,947,701	\$ 358,436
400	Equipment	56,680	56,753	73
500	Additions and Betterments	426,930	426,930	-0-
700	Reconstruction and Replacement	497,321	497,321	-0-
800	Bond Interest and Redemption	8,976,941	8,932,328	-44,613
	TOTAL	\$ 16,547,137	\$ 16,861,033	\$ 313,896

TABLE 2
HETCH HETCHY WATER AND POWER
TAXES
FISCAL YEAR 1971-72

<u>Tax Levying Bodies</u>	<u>Assessed Value</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 1,775.00	\$ 205.78
San Joaquin County	27,600.00	2,985.48
San Mateo County	2,985.00	324.28
Stanislaus County	95,430.00	9,568.56
Tuolumne County	4,684,206.00 (a)	388,206.96
Banta-Carbona Irrigation District	3,100.80	133.33
Oakdale Irrigation District	24,640.00	985.60
West Stanislaus Irrigation District	1,800.00	90.00
	\$4,841,536.80	\$402,499.99

(a) Includes \$3,800,548 assessment for water rights.

TABLE 3

TRANSIT POWER DIVISION

MOTIVE POWER SECTION - SUBSTATIONS

Substation	Type(a)	Date Installed	No. of Units	kW Size	Fiscal Year 1971-72	
					Max. Load in kW	kWH Converted to 600 V d-c
Bryant	M-G	1910	3	1500	2104	6,329,400
	M-G	1910	(b) 2	1500		
Turk	M-G	1910	3	1500	3060	8,126,700
	M-G	1910	(b) 2	1500		
Downtown	SC	1921	2	2000	3330	8,905,800
	SC	1924	1	3000		
Eighth Avenue	SC	(c) 1921	1	1500	1068	2,814,200
	SC	(c) 1921	(b) 1	1500		
	SC	1924	1	2000		
West Portal	MAR	1951	1	2000	2548	7,220,000
Outer Mission	MAR	1953	1	750	854	2,346,000
Geneva	M-G	1910	3	1500	780	21,500
						35,763,600

Notes: (a) Type of Conversion Equipment:

M-G = Motor-Generator

SC = Synchronous Converter

MAR - Mercury Arc Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES

FISCAL YEAR 1971-72

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>UNDER, OVER</u>
110-1	Permanent Salaries	\$ 78,337	62,802	- 15,535
120-1	Temporary Salaries	-0-	2,216	2,216
130-1	Wages	825,104	753,943	- 71,161
	Materials & Supplies	52,400	56,412	4,012
	Accident Compensation	8,000	21,080	13,080
860-1	Retirement Allowance	103,914	90,834	- 13,080
862-1	Social Security	20,280	20,280	-0-
865-1	Health Service System	7,000	7,000	-0-
TOTAL OPERATION AND MAINTENANCE		\$1,095,035	1,014,567	- 80,468
400	Equipment	37,320	30,994	- 6,326
700-1	Reconstruction and Replacement	3,000,000	3,000,000	-0-
TOTAL		\$4,132,355	4,045,561	- 86,794

TABLE 5

HETCH HETCHY WATER AND POWER

SUMMARY OF RECEIPTS AND EXPENDITURES

FISCAL YEAR 1971-72

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
Revenue from Sale of Electrical Energy	\$ 14,102,200	\$ 14,502,230	\$ 400,030
Revenue from Sale of Water and Standby Charge, SFWD	5,000,000	5,000,000	-0-
Other Revenue	<u>95,000</u>	<u>109,723</u>	<u>14,723</u>
	\$ 19,197,200	\$ 19,611,953	\$ 414,753
 <u>EXPENDITURES</u>			
Total Expenditures	\$ 20,658,949	\$ 20,906,594	\$ 247,645
EXCESS OF REVENUE OVER EXPENDITURES	<u>\$ -1,461,749</u>	<u>\$ -1,294,641</u>	<u>\$ 167,108</u>

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

	<u>Normal</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>
<u>SEASON PRECIPITATION (INCHES)</u>						
Hetch Hetchy	34.05	21.68	56.24	35.07	29.95	24.84
Lake Lloyd	46.60	30.80	76.45	51.95	41.94	32.74
Approx. Percent of Normal	100%	64%	162%	106%	88%	71%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	730,785	758,700	1,157,000	889,700	681,600	584,403
Lake Lloyd)						
Lake Eleanor)	427,316	385,600	704,300	518,400	409,100	331,818
Total	<u>1,158,101</u>	<u>1,144,300</u>	<u>1,861,300</u>	<u>1,408,100</u>	<u>1,090,700</u>	<u>916,221</u>
Approx. Percent of Normal		99%	161%	122%	94%	79%
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>						
No-Spill Capacity						
Hetch Hetchy	360,360	293,680	349,575	357,208	356,617	324,530
Lake Lloyd	268,800	197,916	260,021	243,854	199,983	151,653
Lake Eleanor	<u>27,100</u>	<u>26,339</u>	<u>24,286</u>	<u>27,016</u>	<u>27,403</u>	<u>2,110</u>
Total	656,260	517,935	633,882	628,078	584,003	478,293
<u>DELIVERY TO SFWD (ACRE-FT.) (a) (b)</u>						
Average per day		502	561	564	576	640
Maximum per day		861	853	856	748	750
Total for fiscal year		185,342	205,426	206,514	210,992	257,046
Total since operation of Hetch Hetchy Aqueduct began in 1934				3,929,870		

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.

(b) Includes delivery to Livermore site, U.S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1971-72

<u>PLANT DATA</u>	<u>Nameplate Rating</u> <u>(Kilowatts)</u>	<u>Capability</u> <u>(Kilowatts)</u>	<u>Annual Plant</u> <u>Factor - %</u>
Moccasin Powerhouse	90,000	104,000	58.7
Dion R. Holm Powerhouse	135,000	150,000	61.6
Robert C. Kirkwood Powerhouse	<u>67,500</u>	<u>85,000</u>	82.6
Total	292,500	339,000	
<u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse		534,930,000	
Dion R. Holm Powerhouse		809,617,000	
Robert C. Kirkwood Powerhouse		<u>615,055,000</u>	1,959,602,000
<u>Station Service</u>			
Moccasin Powerhouse		951,800	
Dion R. Holm Powerhouse		1,101,570	
Robert C. Kirkwood Powerhouse		<u>903,070</u>	<u>2,956,440</u>
<u>Net Generation</u>			1,956,645,560
<u>Supplementary Energy</u>			
"Bank" Withdrawal*			46,360,466
Purchase (PG&E Co.)			<u>108,734,434</u>
<u>Total</u>			2,111,740,460
<u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts			478,105,789
Modesto Irrigation District			796,740,000
Turlock Irrigation District			360,619,200
Kaiser Cement and Gypsum Corporation			152,127,205
Kaiser Aluminum and Chemical Corporation			33,996,000
Norris Industries, Inc.			17,664,768
Hercules, Inc.			57,906,000
California Ammonia Company			80,876,760
Air Products and Chemicals Co.			
Valley Nitrogen Producers, Inc.			
Miscellaneous Customers			759,065
<u>Non-Revenue</u>			
Project Use			4,287,512
"Bank" Deposit*			9,756,928
<u>Losses</u>			
Hetch Hetchy System			42,679,015
PG&E System (Municipal and Industrial Accounts)			<u>76,222,218</u>
<u>Total</u>			<u>2,111,740,460</u>

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 8

HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1970-71 AND 1971-72
(Nearest 100,000 Kilowatthours)

<u>CUSTOMER</u>	<u>1970-71</u>	<u>1971-72</u>
Municipal Accounts		
International Airport	184,500,000	199,800,000
Municipal Railway	64,100,000	61,900,000
Public Works	24,600,000	24,800,000
Street Lighting	43,400,000	44,500,000
Unified School District	34,400,000	37,100,000
Water Department	42,300,000	40,400,000
Other City Departments	64,800,000	69,600,000
Modesto Irrigation District	728,400,000	796,700,000
Turlock Irrigation District	321,500,000	360,600,000
Kaiser Cement and Gypsum Corp.	152,700,000	152,100,000
Kaiser Aluminum and Chemical Corp.	39,500,000	34,000,000
Norris Industries, Inc.	24,000,000	17,700,000
Hercules, Inc.	94,700,000	57,900,000
California Ammonia Company	104,300,000	80,900,000
Air Products and Chemical Co.	32,700,000	--
Valley Nitrogen Producers, Inc.	108,600,000	--
Miscellaneous Customers	<u>700,000</u>	<u>800,000</u>
 TOTAL	 2,065,200,000	 1,978,800,000

TABLE 9

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1970-71 AND 1971-72
(Nearest \$1,000)

<u>CUSTOMER</u>	<u>1970-71</u>	<u>1971-72</u>
Municipal Accounts		
International Airport	\$ 1,502,000	\$ 1,635,000
Municipal Railway	649,000	626,000
Public Works	299,000	307,000
Street Lighting	459,000	471,000
Unified School District	518,000	549,000
Water Department	372,000	362,000
Other City Departments	808,000	850,000
Modesto Irrigation District	4,295,000	4,640,000
Turlock Irrigation District	1,745,000	2,163,000
Kaiser Cement and Gypsum Corp.	1,270,000	1,337,000
Kaiser Aluminum and Chemical Corp.	342,000	324,000
Norris Industries, Inc.	275,000	193,000
Hercules, Inc.	678,000	434,000
California Ammonia Company	744,000	602,000
Air Products and Chemicals Co.	235,000	--
Valley Nitrogen Producers, Inc.	784,000	--
Miscellaneous Customers	<u>8,000</u>	<u>9,000</u>
TOTAL	\$ 14,983,000	\$ 14,502,000

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

HETCH HETCHY POWER SYSTEM

NET GENERATION	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72
Moccasin Powerhouse	515,158,600	528,512,500	465,854,212	493,702,900	531,070,800	533,978,200
Dion R. Holm Powerhouse	789,570,220	733,220,320	944,664,850	887,037,320	892,230,400	808,515,430
Early Intake Powerhouse	3,000	---	---	---	---	---
Robert C. Kirkwood Powerhouse	210,829,330	613,159,620	598,681,120	615,542,120	630,874,100	614,151,930
Subtotal	1,515,561,150	1,874,892,440	2,009,200,182	1,996,282,340	2,054,175,300	1,956,645,560
SUPPLEMENTAL ENERGY						
"Bank" Withdrawal*	0	116,276,026	81,906,642	191,365,500	133,964,745	46,360,466
Purchase (PG&E Co.)	255,197,673	0	40,798,879	0	46,097,953	108,734,434
Subtotal	255,197,673	116,276,026	122,705,521	191,365,500	180,062,698	155,094,900
TOTAL	1,770,758,823	1,991,168,466	2,131,905,703	2,187,647,840	2,234,237,998	2,111,740,460

DISTRIBUTION

Sales						
Municipal Accounts	361,956,735	388,836,371	412,201,831	427,168,499	458,127,155	478,105,789
Modesto Irrigation Dist.	512,112,000	557,184,000	597,864,000	637,972,000	728,371,000	796,740,000
Turlock Irrigation Dist.	206,568,000	248,457,600	263,616,000	271,156,800	321,456,000	360,619,200
Kaiser Cement & Gypsum	149,419,000	175,655,640	173,061,180	168,705,080	152,736,000	152,127,205
Kaiser Aluminum & Chemical	24,600,324	24,334,411	30,744,000	39,240,000	39,549,000	33,936,000
Norris Industries, Inc.	27,262,886	60,637,939	35,914,140	35,721,216	24,033,485	17,664,768
Dow Chemical Company	95,705,880	75,829,720	23,582,132	---	---	---
Hercules, Inc.	112,572,000	112,338,000	97,776,000	92,844,000	94,662,000	57,906,000
Shell Chemical Co.	50,346,000	50,570,000	---	---	---	---
California Ammonia Co.	18,992,040	100,845,672	101,720,736	103,020,000	104,280,480	80,876,760
Air Products & Chemicals	---	20,762,304	32,930,496	34,617,984	32,653,056	---
Valley Nitrogen Producers	---	---	28,675,920	124,884,480	108,631,560	---
Miscellaneous Customers	1,045,156	1,046,804	1,016,562	664,093	745,614	759,065
Non-Revenue						
Project Use	3,716,688	3,468,127	3,787,748	3,744,004	4,101,136	4,287,512
"Bank" Deposit*	110,919,058	60,324,204	205,895,527	135,151,010	47,826,652	9,756,928
Losses	94,543,056	111,877,674	102,119,431	112,758,674	117,064,260	118,901,233
TOTAL	1,770,758,823	1,991,168,466	2,131,905,703	2,187,647,840	2,234,237,998	2,111,740,460

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1971-72

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>- UNDER</u> <u>+ OVER</u>
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 150,519	\$ 130,292	- 20,227
111	Allowance for Overtime	600	215	- 385
112	Holiday Pay	300	108	- 192
200	Contractual Services	1,400	896	- 504
231	Lighting and Heating of			
	Public Buildings - General	1,135,195	1,221,131	85,936
231-1	Lighting and Heating of			
	Public Bldgs. - Special Fund	4,259,959	4,215,127	- 44,832
231-2	Lighting of Public Streets -			
	Pacific Gas and Electric Co.	600,858	572,995	- 27,863
231-3	Lighting of Public Streets -			
	Hetch Hetchy	433,072	458,369	25,297
231-4	Lighting of Public Streets -			
	Calif. Division of Highways	1,000	1,000	-
300	Materials and Supplies	675	477	- 198
813	Auto Insurance	550	444	- 106
860	Retirement Allowance	17,416	17,416	-
862	Social Security	4,925	4,925	-
865	Health Service System	2,046	2,046	-
954	EDP - PUC Data Processing	12,000	12,000	-
	TOTAL	<u>6,620,515</u>	<u>6,637,441</u>	<u>16,926</u>

RECEIPTS

Interfund Receipts*	\$5,327,007	\$5,382,454	55,447
Ad Valorem Taxes	<u>1,293,508</u>	<u>1,254,987</u>	- <u>38,521</u>
	6,620,515	6,637,441	16,926

WORK ORDER APPROPRIATIONS FROM ROAD FUND

<u>DESCRIPTION</u>	<u>TOTAL</u> <u>FUNDS</u>	<u>EXPENDITURE</u>	<u>- UNDER</u> <u>+ OVER</u>
Maintenance and Repair of			
Street Lighting Installations	\$ 147,200	\$ 145,525	- \$ 1,675

*Transfers from other departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES

FISCAL YEAR 1971-1972

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION KILOWATT-HOURS</u>	<u>EXPENDITURES</u>
Art Museum	1	701,568	8,086
Auditorium and Brooks Hall	1	4,291,400	47,711
Child Care Centers	9	125,357	3,069
City Planning	1	76,480	1,571
De Young Museum	1	2,712,000	26,636
Disaster Corp.	2	997	59
Electricity	5	456,099	7,939
Farmer's Market	1	25,687	594
Fire (a)	57	3,083,156	62,167
Hasaler Health Home	1	693,600	7,475
Health	21	14,234,651	139,094
Hetch Hetchy	6	134,230	3,670
Hidden Valley Ranch	1	872,400	10,518
International Airport (b)	7	199,825,830	1,634,727
Junior College District	13	7,008,326	74,590
Legion of Honor	1	440,000	5,946
Library	31	2,817,636	47,014
Log Cabin Ranch	13	362,771	9,996
Municipal Railway	37	61,947,434	626,234
Parking Authority	18	187,271	4,477
Police	17	921,855	18,501
Public Building	9	16,412,771	141,626
Public Works	71	24,489,602	300,624
Purchasing	5	500,839	7,530
Recreation and Park	198	10,289,016	176,187
Recreation and Park - Yacht Harbor	33	1,267,139	27,328
Sheriff	3	1,874,720	17,490
Social Services	7	1,248,664	16,694
Street Lighting Operations (.003)	-	44,482,256	458,369
Unified School District	226	30,067,038	474,432
War Memorial	1	1,280,432	16,260
Water	117	40,375,429	361,961
Youth Guidance	3	1,524,246	15,630
TOTAL MUNICIPAL DEPTS.	917	474,730,900	4,754,205
Academy of Sciences	2	3,084,946	27,826
Mount Davidson Cross Lighting	-	(c)	1,200
State of Calif: Street Lighting	1	(d)	12,115
Traffic Devices	1	289,943	5,732
TOTAL FROM HETCH HETCHY	921	478,105,789	4,801,078
Fire Dept., For Resale to Fort Mason	1	2,746,350	35,190
GRAND TOTAL	922	480,852,139	4,836,268

NOTES: (a) Electricity purchased for resale to Fort Mason excluded.

(b) Includes 160,587,573 KWH resold at Commercial rates for \$1,373,166 to Airport tenants.

(c) Included under Recreation and Park.

(d) Included under Street Lighting Operations.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1971 - 1972

<u>DEPARTMENT</u>	<u>NATURAL GAS</u>		<u>EXPENDITURE</u>
	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	
Auditorium and Brooks Hall	2	821	87
Child Care Centers	7	25,637	1,900
City Planning	1	5,176	375
De Young Museum	1	298,361	18,603
Disaster Corp.	1	299	35
Electricity	2	53,554	3,686
Farmer's Market	1	778	70
Fire	58	706,778	48,051
Hassler Health Home	3	246,718	16,698
Health	21	6,741,104	260,353
Hetch Hetchy	2	781	93
International Airport	6	1,601,623	86,574
Junior College District	9	777,118	47,545
Legion of Honor	1	1,488	105
Library	29	115,129	8,289
Municipal Railway	12	275,854	18,841
Police	12	49,103	3,545
Public Buildings	5	1,447,134	81,707
Public Works	15	417,028	30,587
Purchasing	3	60,866	3,949
Recreation and Park	106	1,412,918	97,902
Registrar of Voters	1	8,580	609
Sheriff	2	391,701	23,007
Single Men's Rehabilitation Center	1	35,579	2,441
Social Services	5	71,021	5,234
Unified School District	216	4,310,794	287,715
War Memorial	3	258,128	17,416
Water	12	137,562	9,581
Youth Guidance	4	453,829	25,995
TOTAL MUNICIPAL DEPARTMENTS	541	19,905,462	1,100,993
Academy of Sciences	2	290,509	17,008
GRAND TOTAL	543	20,195,971	1,118,001

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Social Services	1	2,389,700	4,241

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1972

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY- OWNED</u>	<u>JOINTLY- OWNED</u>	<u>CITY- OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500 " "	256	24	109	389
4,000 " "	1,085	130	1,723	2,938
6,000 " "	580	457	3,269	4,306
10,000 " "	448	21	570	1,039
23,000 " Fluorescent	---	---	---	---
400-Watt Mercury Vapor	46	---	163	209
1,000 " "	---	---	3	3
175-Watt Mercury Vapor	---	---	8	8
250 " "	2	---	---	2
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	107	107
2,500 " "	17	4	67	88
4,000 " "	192	2	80	274
6,000 " "	42	5	82	129
10,000 " "	3	---	21	24
5,500 " Fluorescent	---	---	38	38
23,000 " "	39	---	2	41
100-Watt Mercury Vapor	---	---	104	104
175 " "	44	---	2,773	2,817
250 " "	34	---	941	975
400 " "	296	291	3,956	4,543
700 " "	---	---	362	362
1,000 " "	---	---	140	140
400 " Lucalox	---	---	21	21
<u>OVERHEAD CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	2	---	---	2
4,000 " "	36	---	42	78
6,000 " "	2	---	---	2
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	16	---	---	16
4,000 " "	52	---	11	63
6,000 " "	4	---	---	4
175-Watt Mercury Vapor	14,937	---	1	14,938
250 " "	1,969	---	---	1,969
400 " "	941	---	---	941
TOTAL, JUNE 30, 1972	<u>21,043</u>	<u>956</u>	<u>14,593</u>	<u>36,592</u>
	57.5%	2.6%	39.9%	100%
TOTAL, JUNE 30, 1971	21,434	1,192	13,252	35,878
NET CHANGE DURING THE YEAR	-391	-236	+1,319	+692

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1971-72

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	805,242		
Jointly-owned facilities (a)	56,369		
City-owned facilities (b)	139,111	1,003,722	
Less deduction for energy component		430,727	572,995
Emergency service to City-owned facilities			3,248

Lease-Lite Corporation

Group lamp replacement - City-owned facilities			44,257
--	--	--	--------

MAHONEY ELECTRIC

Maintenance and repair - City-owned facilities			
Routine maintenance		46,025	
Repair of damage caused by accidents (c)		28,064	
Repair of damage caused by equipment failure		15,432	
Repair of damage caused by vandals		2,037	91,558

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	15,346		
Damage caused by equipment failure		134	
Damage caused by vandals		-	15,480

ELECTRIC ENERGY (HETCH HETCHY)

44,482,256 kWh @ \$0.01345 less 21% discount		472,646	
--	--	---------	--

TOTAL EXPENDITURE		1,200,184	
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LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway routes	12,128		
Recreation and Park Dept. for off-street lighting	2,098		14,226

TOTAL NET EXPENDITURE		<u>1,185,958</u>	
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AVERAGE OPERATING COST

Based on number of lights in service June 30, 1971, average total cost of operation, maintenance and repair per light per year:		<u>32.43</u>	
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- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16

BUREAU OF LIGHT, HEAT AND POWERNEW CITY-OWNED STREET LIGHTING INSTALLATIONSCOMPLETED DURING FISCAL YEAR 1971-72

<u>Location</u>	<u>No. of Lights</u>	<u>Type of Lights(a)</u>	<u>Value</u>
Financed by 1964 Street Lighting Bonds:			
Cayuga, Mt. Vernon Area	38	M	38,452
El Sereno Court	1	M	970
Fell Street, Baker to Steiner	11	M	13,095
Fulton Street, and adjacent streets	128	M	138,202
Lakeside Area	58	M	76,893
Lincoln Way, Arguello to 30th	109	M	39,914
Miraloma Park Area	252	M	432,864
Pacific Heights Area	190	M	188,342
South of Market Area Contract 1A	234	M	287,152
South of Market Area Contract 1B	157	M	189,916
South of Market Area Contract 1C	133	M	178,018
South of Market Area Contract 2	127	M	185,398
Sacramento, Fillmore to Divisadero	45	M	40,795
TOTAL	1,483		1,810,011
Financed by State Gasoline Tax:			
Alamo Square Area Contract 1	16	M	34,230
Bernal Heights Stages I & II	54	M	40,860
Castro, Market to Duboce	22	M	39,522
Clayton, Corbett Stairway	1	M	1,140
Fell Street, Baker to Steiner	10	M	11,905
Golden Gate Heights	9	M	9,147
Mason Street, Sacramento to Pacific	15	M	20,947
Masonic, Geary to Page	123	M	65,670
Monterey Blvd., Ridgewood to Circular	102	M	92,515
North of Market Contract 2A	6	M	4,716
Pennsylvania Ave.	2	M	1,945
Pine Street, Van Ness to Presidio	97	M	98,941
Russian Hill Area Stages II & III	66	M	75,364
Webster, Golden Gate to Grove	20	M	23,680
Army Street Circle Contract 2	10	M	9,892
Winfield Street	12	M	9,060
Redevelopment Area E-1 Contract K	2	M	2,000
TOTAL	567		541,534
GRAND TOTAL	2,050		\$ 2,351,545

Notes: (a) M - Mercury Vapor
I - Incandescent

TABLE 17

BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to July 1, 1953	\$1,748,675	\$617,115	-	\$576,404	\$22,650	\$477,651	\$3,442,495
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	155,727	30,817	-	748	16,578	543	204,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	-	182,762
1959-60	-	100,126	-	35,874	10,242	538	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	474,673	\$522,899	-	-	-	997,572
1966-67	-	111,164	188,312	5,000	-	-	304,476
1967-68	-	175,949	331,941	-	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	-	1,031,201
1969-70	-	359,635	261,000	-	-	-	620,635
1970-71	-	490,031	1,550,442	-	-	-	2,040,473
1971-72	-	541,534	1,810,011	-	-	-	2,351,545
TOTALS	\$2,178,926	\$4,413,493	\$5,281,327	\$878,534	\$197,350	\$498,275	\$13,447,905
LESS: Cost of portions removed prior to fiscal year 1970-71						857,909	1,506,323
Cost of portions removed during fiscal year 1971-72						648,414	\$11,941,582
Original Cost of City-Owned Facilities in Service June 30, 1971							

*Includes WPA and PWA (1935-1942), Boulevard Construction (1932-1934), Municipal Transit System, Park and Recreation, and Housing Authority.

TABLE 18
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1971-72

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
HH-423	Moccasin Reservoir Bypass	Glanville Construction Co.	5-24-71	3-8-72	1,028,168	1,026,866
HH-428	Restoration of Trolley Overhead on Mission & 16th St.	Abbett Electric Corp.	9-28-70	7-28-71	109,278	2,022
HH-429	Construct Three Residences Early Intake	Hetch Hetchy Water and Power	6-11-71	4-3-72	95,000	102,146
HH-430	Extension of Utilities to Three Residences at Early Intake	City Appliance and Electric	6-28-71	10-22-71	21,995	21,995
HH-431	Repairs to Holm Penstock	OBCO Contractors & Eng.	7-26-71	10-7-71	66,050	68,404
HH-432R	Seal Coat and Road Repairs Jones Point to Mather Highway 120 to Cherry Dam Moccasin Village Area, & Surfacing Holm Powerhouse Road	Harold Tower Construction	5-17-71	7-28-71	91,925	51,606
HH-433	Moccasin-Newark Transmission Line - Paint Steel Tower (Towers 266N to 458N)	Clinton A. White Painting Company	9-28-70	7-28-71	14,750	295
HH-434	Replacement of metal roofing and Siding Moccasin Shops	Roofing Constructors, Inc.	9-7-71	3-4-72	53,763	56,271
HH-435	Repairs to Holm Powerhouse	Western Waterproofing, Inc.	7-19-71	9-15-71	12,584	12,584
HH-438	Paint and Remodel Moccasin Administration Bldg. and Dormitory	Charles I. Cunningham Co.	8-2-71	-	23,888	18,274

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1971-72

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Started</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-439	Clearing Transmission Line Rights of Way	Pacific Tree Expert Co.	9-13-71	4-28-72	30,389.50	27,961.00
HH-440R	Paint Steel Trolley Poles	J. Wm. Sorenson	9-27-71	-	51,240.00	45,661.00
HH-441	Additions to Truck Port and Washing Facilities Moccasin	Charles I. Cunningham	11-15-71	3-22-72	29,999.00	29,999.00
HH-442	Motorize Valve - San Joaquin Pipe Line - Oakdale Portal and Tesla Portal Valve Houses	OBCO Contractors and Engineers	6-1-71	-	28,280.00	3,402.00
HH-445	Outer Mission Substation Car Guard	Wm. McIntosh & Son	9-20-71	10-19-71	1,439.00	1,505.00
HH-447	Post Street Trolley Coach Overhead	Abbett Electric Corp.	10-26-71	-	265,378.00	198,560.00
HH-449	Cottage No. 1 O'Shaughnessy Dam Renovate and Repair	Charles I. Cunningham	5-3-71	11-16-71	3,888.00	3,888.00
HH-455	Moccasin-Newark Transmission Line, Paint Steel Towers (111-N to 262-N)	C. C. Knight Painting	9-13-71	10-4-71	20,500.00	20,500.00
HH-456	Resurface Mather-Hetch Hetchy Road	George Reed, Inc.	9-13-71	10-14-71	118,890.00	130,890.00

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS FISCAL YEAR 1971-72						
Contract No.	Description	Contractor	Started	Completed	Original Contract Price	Value of Work Done During Fiscal Year
HH-458	Relocation of Moccasin-Newark Transmission Line Tower No. 970	Abbett Electric Corp.	8-16-71	9-10-71	12,975.00	12,975.00
HH-459	Replacement of Electric Substation, Alameda East Portal	Brayer Electric Co.	4-17-72	-	9,477.00	-
HH-461	Improvements to Domestic Water Supply, Moccasin	E. H. Morrill Co.	5-22-72	-	37,824.00	-
Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year:						\$1,835,804.00

TABLE 19
HETCH HETCHY WATER AND POWER
PURCHASE ORDERS FOR EQUIPMENT
FISCAL YEAR - 1971-72

<u>Purchase Order No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time</u>		<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
			<u>Started</u>	<u>Completed</u>		
R-70155	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66	1-28-72	807,266	58,351
R-63758	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66	1-28-72	1,050	1,050
Total Amount of Work Done Under Hetch Hetchy Purchase Orders During Fiscal Year						\$59,401

1972 ANNUAL REPORT 1973
HETCH HETCHY WATER AND POWER

PUBLIC UTILITIES COMMISSION
CITY AND COUNTY
OF SAN FRANCISCO



CITY AND COUNTY OF SAN FRANCISCO

JOSEPH L. ALIOTO - MAYOR

PUBLIC UTILITIES COMMISSION

H. WELTON FLYNN	President
OLIVER M. ROUSSEAU	Vice President
JOSEPH J. DIVINY	Commissioner
LOUIS A. PETRI	Commissioner
JOSEPH P. BYRNE	Commissioner
JOHN D. CROWLEY	General Manager

ANNUAL REPORT
FISCAL YEAR 1972-73

HETCH HETCHY WATER AND POWER *Annual Report* DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to Hetch Hetchy employees, past and present, whose devoted and conscientious efforts have made possible these accomplishments for San Francisco.



HETCH HETCHY RESERVOIR

HIGHLIGHTS - 1972-73

Hetch Hetchy power revenues increased to \$14,662,650 from \$14,502,230 for the preceding year. Revenue for sale of water and standby service to the San Francisco Water Department was \$5.5 million, an increase of half a million dollars.

\$2.19 million in Hetch Hetchy power revenues were expended this year for the operation, maintenance and improvement of the electrical facilities of the San Francisco Municipal Railway, thus sparing City taxpayers the payment of this amount as an additional subsidy.

\$1,035,000 was appropriated for undergrounding Municipal Railway electrical feeder cables, to be performed under the newly inaugurated Power Improvement Program.

This program will modernize all of Muni's electrical facilities for conversion and distribution of the direct current which operates all streetcars and trolley coaches. The cost of the program is estimated at \$30 million; \$10 million to be provided from Hetch Hetchy revenues, \$20 million to be provided by the Federal Government's Urban Mass Transit Authority.

Hetch Hetchy furnished power for the Municipal Railway and all other purposes at rates well below those which would have been charged by the Pacific Gas and Electric Company, a further saving to the taxpayers of approximately \$1 million. During the past ten years, electrical consumption for municipal purposes has increased 86.9%.

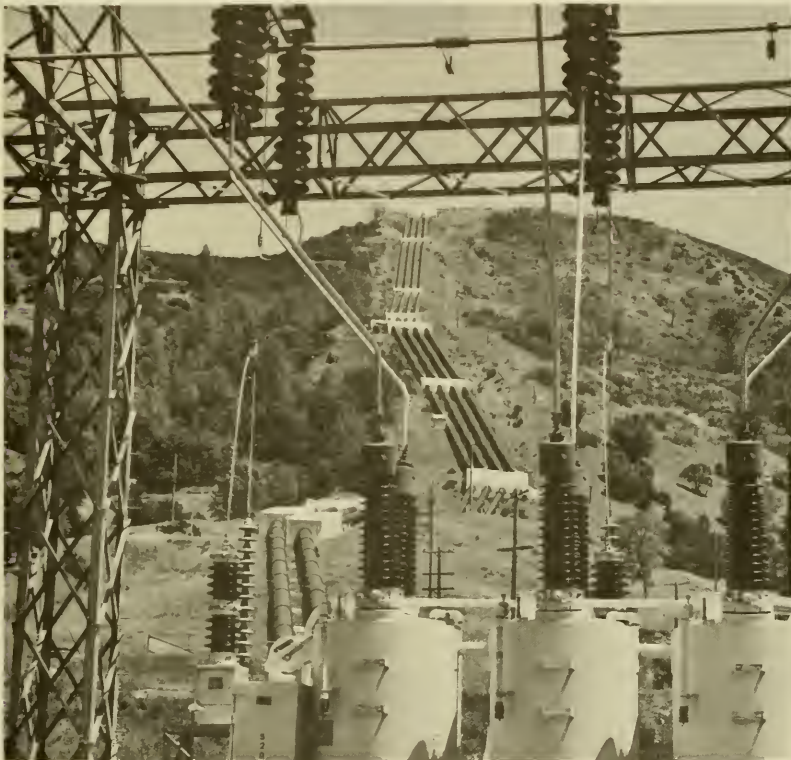
A new contract was negotiated with the Turlock Irrigation District, effective May 1, 1972 through June 30, 1985. A similar contract was also negotiated with the Modesto Irrigation District, effective July 1, 1973 through June 30, 1985. Both contracts will have two rate schedules, one effective for the contract term through July 31, 1975 and, the other, effective August 1, 1975 through June 30, 1985. The rates for the second part of the contract term are approximately 19 percent higher than those in the first part, resulting in some \$11 million additional return to City for the last ten years of the contract.

A total of 406 new City-owned electroliers were placed in service at a cost exceeding \$415,000. The cost per capita of street lighting was approximately \$1.92.

HETCH HETCHY ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, the HETCH HETCHY WATER AND POWER DEPARTMENT and BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. Approximately three-fourths of the water consumed in San Francisco and the Water Department service area comes from this source. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.



MOCCASIN SWITCHYARD AND POWERHOUSE PENSTOCKS



WALLACE E. STUART
Moccasin Powerhouse Superintendent

Through its Transit Power Division, Hetch Hetchy has operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Railway since July 1, 1969. At that time, the Public Utilities Commission decided to transfer the responsibility for the conversion and distribution of electrical power to streetcars and trolley buses in San Francisco from the Municipal Railway to Hetch Hetchy Water and Power. Now, Hetch Hetchy not only generates and transmits the electrical power from the Sierra Nevada to the Bay area as it has in the past, but distributes this power directly to the transit vehicle.

In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Overhead Lines and Motive Power Sections of the Municipal Railway. Personnel for this division includes fifty-one employees in twelve different categories. Last year, this responsibility cost Hetch Hetchy, and saved San Francisco taxpayers, \$2.19 million.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design and construction of City-owned street lighting improvements are under the jurisdiction of the Department of Public Works. In accordance with provisions of the City and County Administrative Code, plans for these improvements must be approved by the Public Utilities Commission through this bureau. The bureau is financed by appropriations from municipal departments and gas tax funds.

For the fiscal year 1972-73, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>Number of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	187	\$ 18,398,045
Hetch Hetchy Water and Power (Transit Power Division)	52	2,324,312
Bureau of Light, Heat and Power	<u>11</u>	<u>7,046,410</u>
	250	\$ 27,768,767



THOMAS PARKER
Storekeeper, Moccasin

HETCH HETCHY WATER AND POWER SYSTEM

REVENUE AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and three industrial customers:

Kaiser Cement & Gypsum Corporation	Santa Clara County
Kaiser Aluminum & Chemical Corporation	Santa Clara County
Norris Industries, Riverbank	Stanislaus County

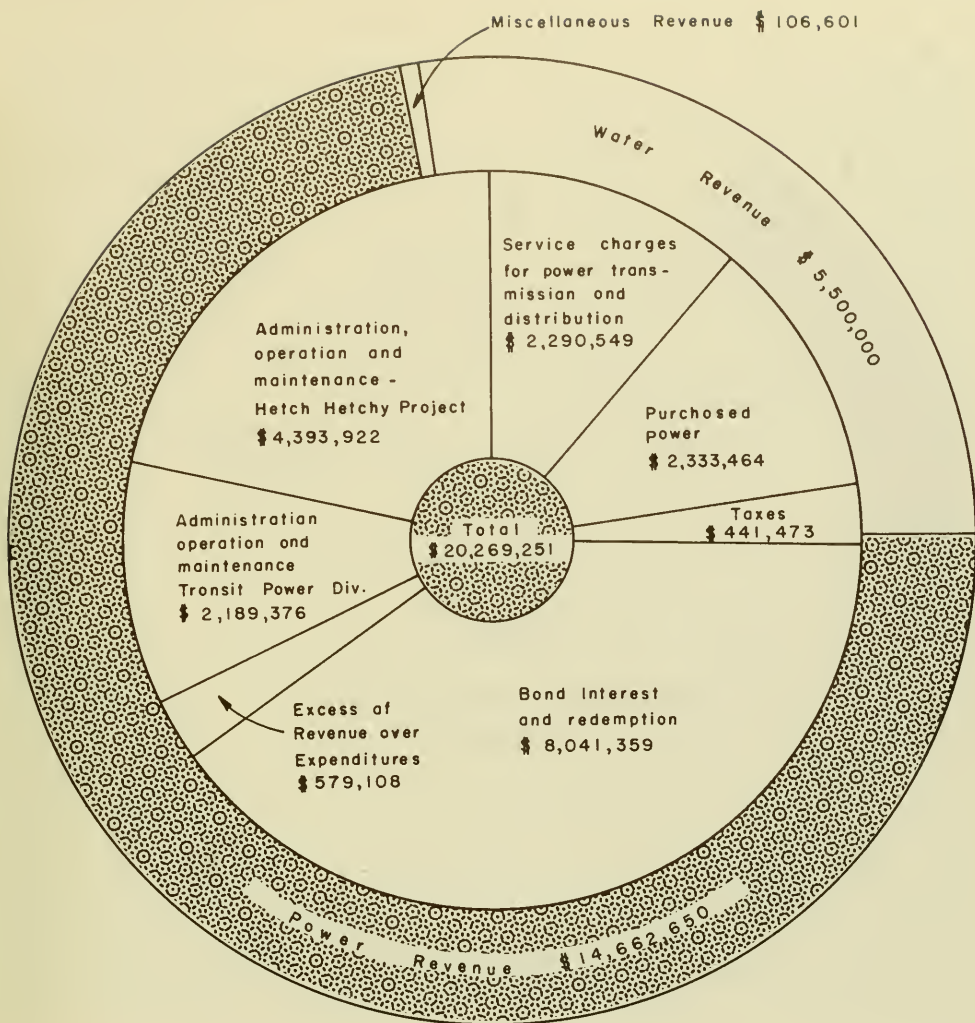
2. Sale of water to the San Francisco Water Department.

This past year, revenue from sale of water and standby service to the San Francisco Water Department totaled \$5.5 million.

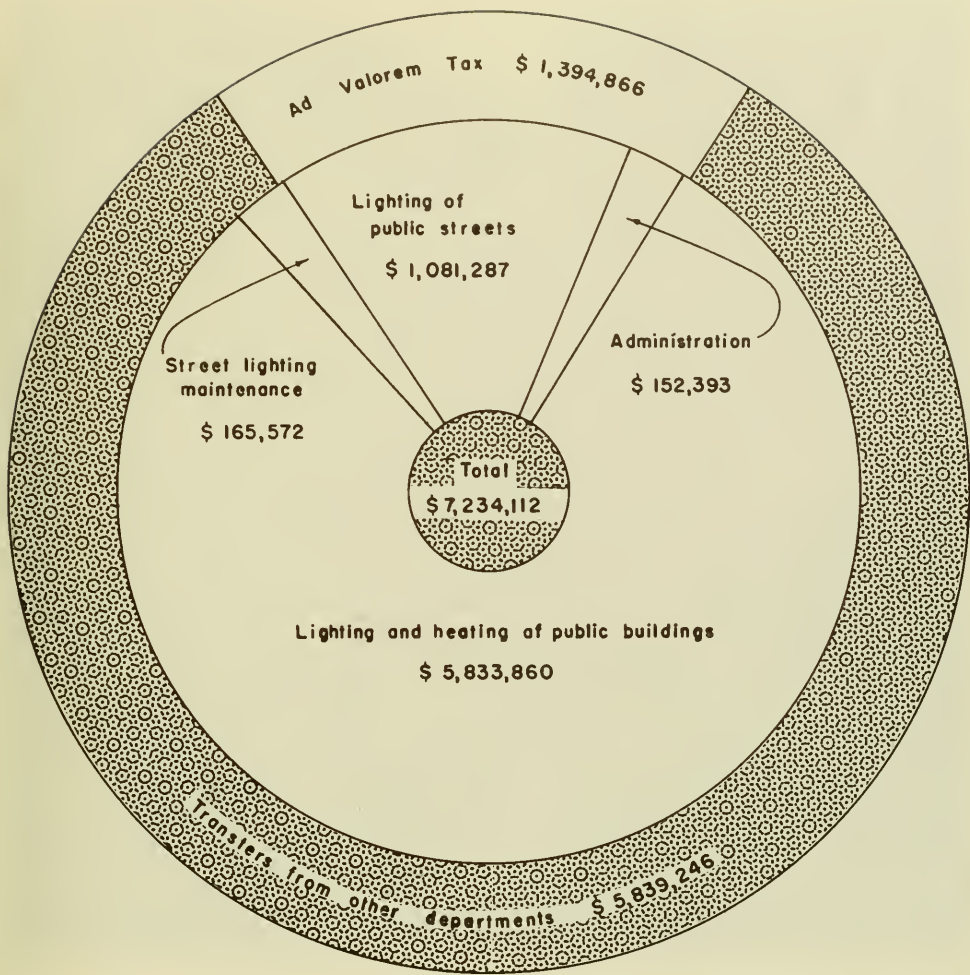
Gross sales of electric energy amounted to \$14,662,650, compared to \$14,502,230 during the year 1971-72. This increase in electric revenue reflected the increase in actual sales during the year: 1,988,623,127 Kilowatthours as compared to 1,978,794,787 Kilowatthours for 1971-72.

Revenue for service orders, rentals, meals and miscellaneous items totaled \$106,601.

Expenditures are summarized on the pie chart following and are detailed in the appendix.



HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1972-73



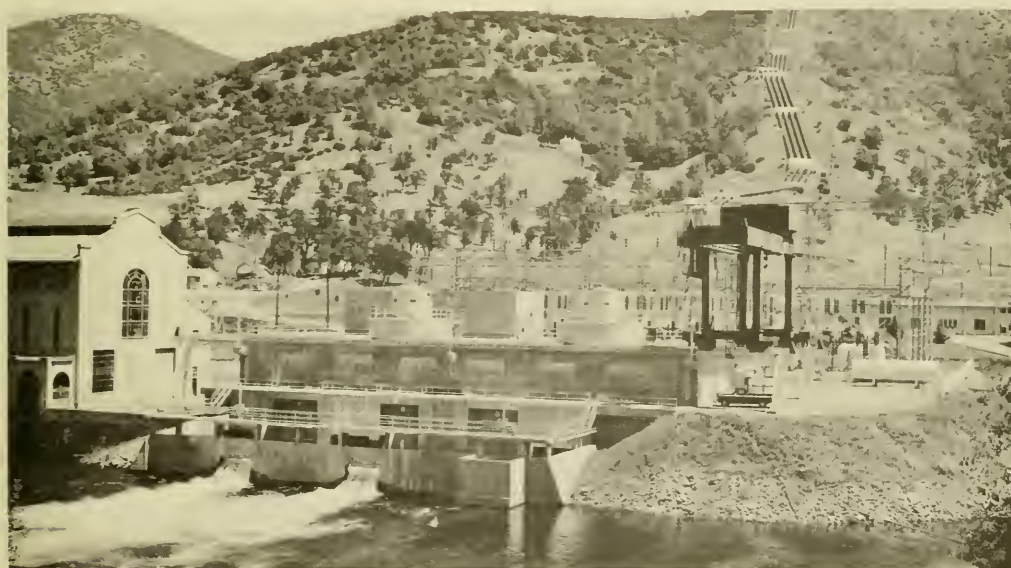
BUREAU OF LIGHT, HEAT & POWER
REVENUES AND EXPENDITURES
FISCAL YEAR 1972 - 73



EARLY INTAKE



MOCCASIN ADMINISTRATION OFFICES AND CLUBHOUSE

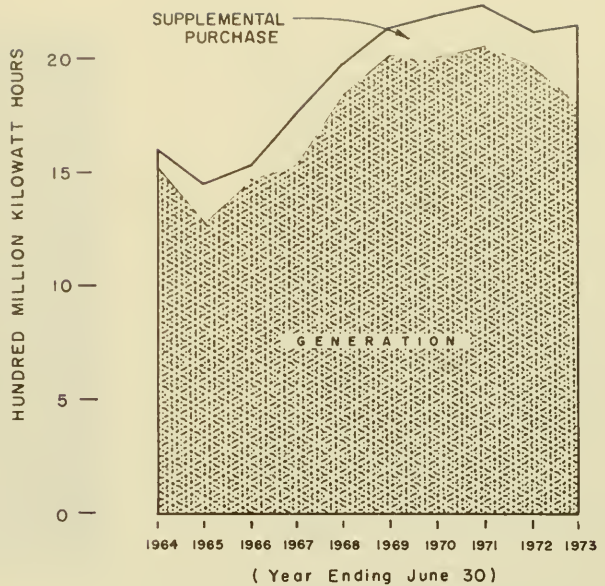


MOCCASIN POWERHOUSE AND PENSTOCKS

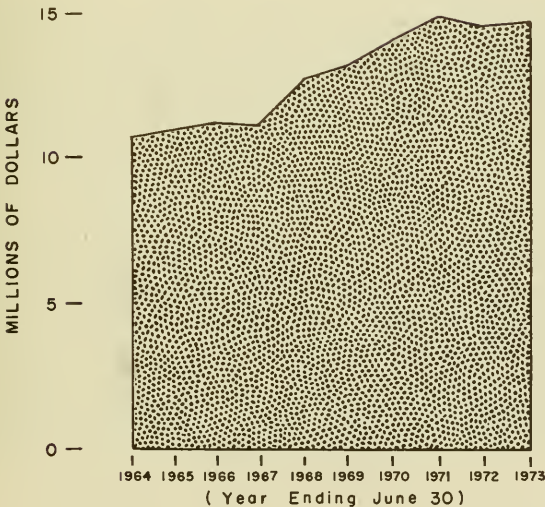
POWER SALES

Power and energy delivered to all City Departments increased 6.3% over the previous year, more than half of which is accounted for by the San Francisco International Airport. The annual percentage increase in electric energy consumption by the Airport is continuing at about the same 8% rate as the previous year, indicating that airport expansion is still proceeding at a steady pace.

Hetch Hetchy power is sold to City Departments at cost, representing a saving to taxpayers

HETCH HETCHY
ENERGY GENERATION AND PURCHASE

for 1972-73 of nearly \$1 million compared to the cost, if supplied by local investor-owned utility.



REVENUE FROM SALE OF ELECTRIC ENERGY

Power and energy delivered to Modesto Irrigation District, Hetch Hetchy's largest power customer, and to Turlock Irrigation District, the third largest, increased by 7.8% and 16.9% respectively this year. Modesto's increase is generally the result of normal load growth. The reason for Turlock's spectacular increase in purchase is twofold: (1) normal load growth and (2) less generation available from their



THEODORE L. CHUNG
Senior Electrical Engineer

own generating plant because the amount of water storage at Don Pedro carried over from the 1972 spring runoffs was very much less than normal. This unfavorable water condition had very little effect on Modesto's purchase, since Modesto normally generates less than 20% of their total load requirement and Turlock's own generation normally accounts for 50% or more of their total requirement which is about half of Modesto's total.

Gross sale of electric energy amounted to \$14,662,650 compared to \$14,502,230 during 1971-72. This increase in electric revenue is related to the 5.0%

increase in energy sales to customers. However, total generation available from the Hetch Hetchy powerhouses actually declined 8.1%, as compared to 1971-72, because of the subnormal 1972 spring runoffs. The adverse effect of this is noted by the increase in expenditure for supplementary power and energy from \$879,490 to \$2,239,821.

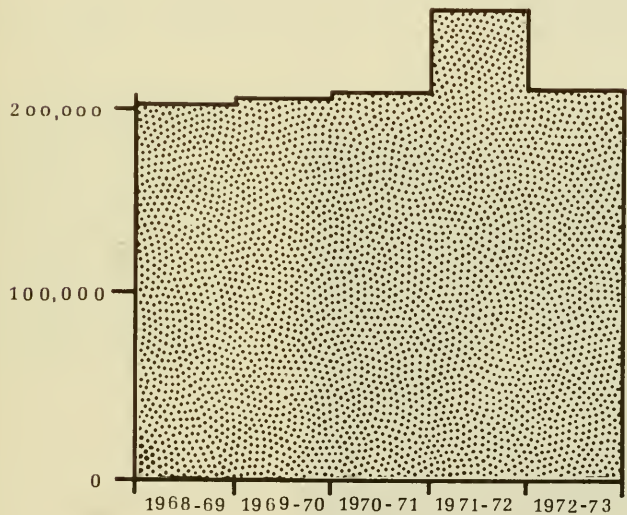
WATER PRODUCTION AND TRANSMISSION

Precipitation recorded for the year at our measuring stations was 102% of average. During the year, 69,393,300,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 77% of the City's total customer consumption. In addition, 236,789,124 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 46,280,256 gallons were delivered to Groveland Community Service District in Tuolumne County from the Mountain Tunnel.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.

Acre Feet
Delivered
To SFWD

300,000 +



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT

OPERATIONS AND MAINTENANCE

Warnerville Substation
Transformer No. 1



VERNON A. LANNES
Sr. General Utility Mechanic

in Japan, for repair, at a cost of \$46,939,680 Japanese Yen (equivalent to US\$160,000). The repaired autotransformer was returned to the substation on May 23, 1973 and placed back in operation on June 17, 1973, just in time for this summer's peak electric power demands.

Autotransformer No. 1 at Warnerville Substation, consisting of one-half of the total 300,000 KVA station transformer capacity, failed on June 30, 1972. This reduces greatly Hetch Hetchy's capacity to deliver electric power to the Modesto Irrigation District. However, after emergency switching arrangements, and maximum loading of the remaining transformers, Hetch Hetchy was able to continue delivery of the required amount of power to Modesto. The autotransformer was shipped in October 1972 to the manufacturer, Meidensha Electric Manufacturing Company, Ltd.,



DEAN W. COFFEY
Assistant Superintendent
Maintenance and Repair

Holm Powerhouse Shutdown

The Dion R. Holm Powerhouse was shut down during the month of February 1973. Major powerhouse repairs and preventive maintenance were thus accomplished during this seasonal period of lower demand for electricity when certain facilities could be shut down for work requiring a longer period of time than the weekends which can be scheduled during much of the rest of the year. This work included a complete overhaul of the mechanical and electrical elements of the turbines, generators and transformers.



KENNETH O. FRILEY
Assistant Mechanical Engineer

TRANSIT POWER DIVISION

The Transit Power Division is responsible for supplying the 600 volt direct current power that is necessary to operate the streetcars and trolley coaches of the San Francisco Municipal Railway.

The Transit Power Division is composed of two sections - the Motive Power Section and the Overhead Lines Section.

Motive Power Section

The Motive Power Section operates and maintains seven substations which convert electric power from 12,000 volts alternating current to 600 volts direct current by means of motor-generators, synchronous converters and mercury arc rectifiers. (See Appendix Table 3 for statistical data.) Motive Power is also responsible for maintaining the electric motors and associated control equipment for operating the cable-winding machinery located in the Cable Car Powerhouse at Washington and Mason Streets. In addition, Motive Power is also responsible for periodic inspection, cleaning, adjustment and repair of the streetcar and trolley coach recorders at Central Control of the Municipal Railway.

During the past fiscal year, numerous voltage and ampere readings were taken on various feeders throughout the system. As a result, we were able to make several improvements to the 600 volt direct current supplied to the Municipal Railway.

The 183 Relay is only needed for protection when connected to other power sources. Since feeder circuit 2401 is not normally connected to any other power source, we installed a cutout switch to disable the 183 Relay unless it was needed.

Overhead Lines Section

The primary function of the Overhead Lines Section is to maintain in satisfactory operating condition the trolley wire overhead facilities and the electric distribution system which conveys power to it. The electric distribution system consists of both overhead lines and underground cables.

Secondary functions include the maintenance of the Municipal Railway Signal Systems and the electric light and power systems of all Municipal Railway buildings.

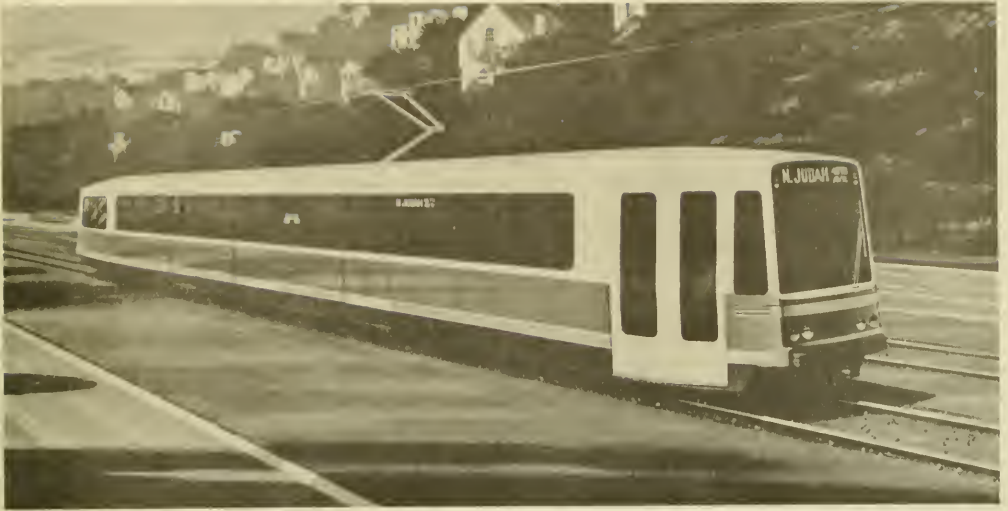


DAVID YEH
Clerk - Library

A considerable amount of damage to overhead facilities was caused by trolley coaches dewiring and snagging their poles in the overhead facilities and tearing them down or by breaking the spans with the flaying poles. Such damage was repaired at no cost to the Municipal Railway. Other parties who damaged our facilities were billed for the cost of repairs. This included damage to overhead facilities caused by high loads on trucks or careless operation of crane equipment, and damage to underground feeder cables by contractors digging into our duct lines. During 1972-73, responsible parties were billed for 11 damage cases totaling \$35,532.99.

The Overhead Lines Section also performed work for building owners and contractors under work orders amounting to ten jobs totaling \$9,989.00. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily removing trolley wires and feeders to permit passage of high loads, and shifting of trolley wires and feeders for various excavations.

The Overhead Lines Section engaged in many other activities of a related nature which it is especially equipped to perform. These additional duties included repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car system; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.



MODEL OF LIGHT RAIL VEHICLE

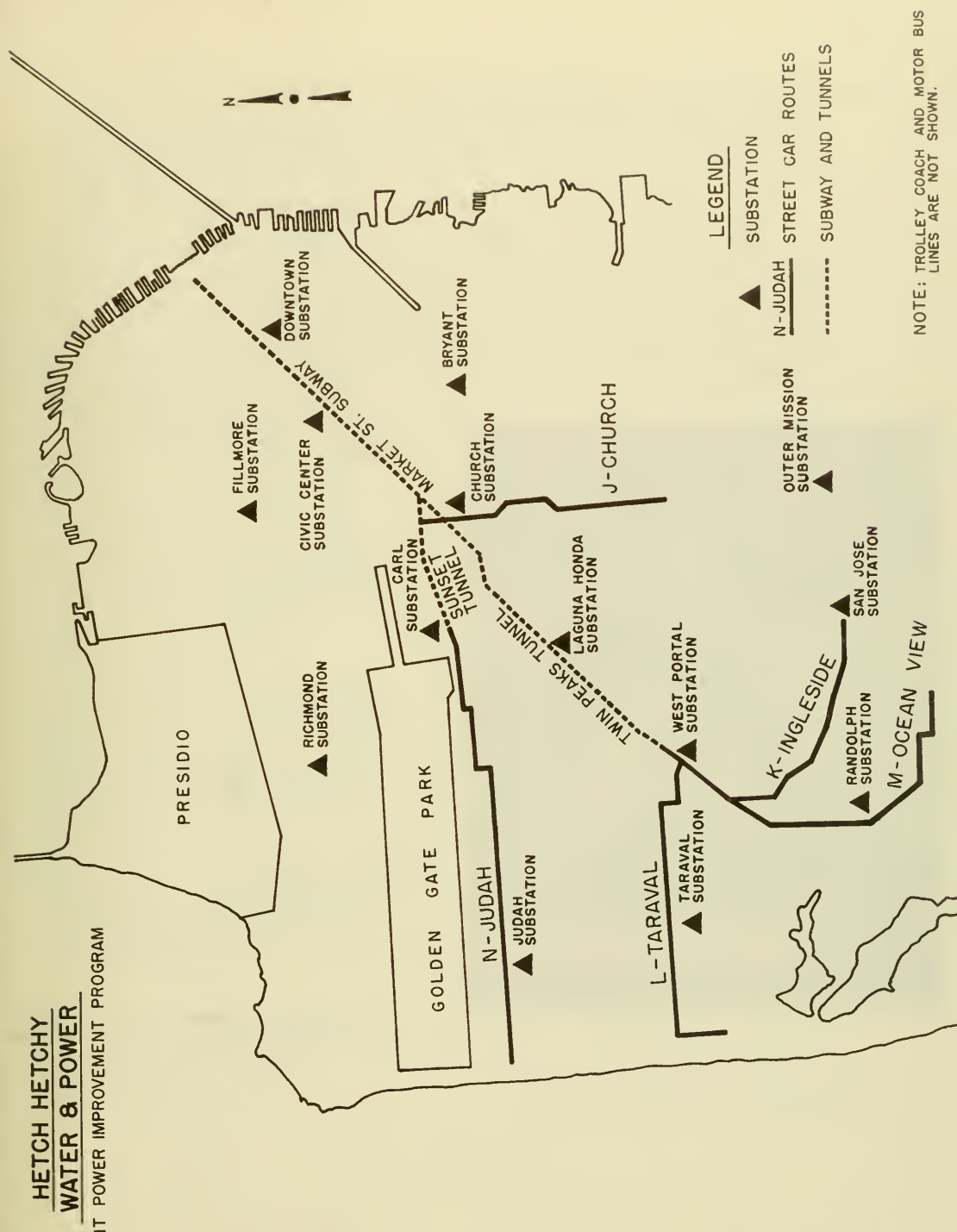
TRANSIT POWER IMPROVEMENT PROGRAM

San Francisco, in common with several other cities around the country, has embarked on a large program to improve its mass transit. Hetch Hetchy's share of this effort is the Power Improvement Program, designed to update and enlarge the existing electric power system for the streetcars and trolley coaches of the Municipal Railway (Muni). The Program is based on the City's dedication to making maximum use of non-polluting electrical energy in providing better public transportation.

More specifically, the Program will provide the additional power needed for the new streetcars (called Light Rail Vehicles or LRVs) which have been ordered to replace the existing PCC cars. The Program will also provide for a much-needed rehabilitation, replacement and modernization of old equipment, some of which has been in service since the turn of the century and is now beyond economical repair.

HETCH HETCHY WATER & POWER

TRANSIT POWER IMPROVEMENT PROGRAM



NOTE: TROLLEY COACH AND MOTOR BUS LINES ARE NOT SHOWN.

The Program is estimated to cost \$30 million, and is supported in part by a grant from the Federal Urban Mass Transportation Administration and, in part, by revenues from the Hetch Hetchy Water and Power System. Principal features of the Program are described in the following paragraphs.

Power Cable Undergrounding Project

Most of the cables which deliver power to the trolley wires are overhead on pole lines, and are not only unsightly but in many locations are in poor condition and must be replaced. Moreover, new cables must be added to the system to carry the additional energy required by the Municipal Railway for its new vehicles. To accomplish these objectives, at least thirty miles of underground ducts are to be built over the next four years. These ducts will contain the power cables for all of the surface streetcar lines and most of the trolley coach lines.

Substation Project

At the present time, there are seven City-owned substations which provide power for the Municipal Railway. These substations convert alternating current to direct current (at 600 volts) to operate the streetcars and trolley coaches. However, the conversion equipment is obsolete and no longer economical to maintain.

The plan is to replace the equipment in existing substations, and to build new substations, for a total of fourteen for the expanded system.

All of the substations will be equipped with silicon diode rectifiers, the modern solid-state replacement for the



GALEN SARNO
Associate Electrical Engineer



STANLEY F. DAVIS
Senior Architect

existing rotating machines and mercury-arc rectifiers. The new system will have a total capacity of 69,000 kilowatts, compared to 28,250 kilowatts at present. The silicon diode rectifier systems will have a very high degree of reliability, and, most importantly, will provide adequate power to enable the new Light Rail Vehicles to operate at their full capacity.

Transit Power Control and Communication

The new substations described above will ultimately be operated by a power dispatcher from a central supervisory control room. In this room a dispatcher's display and control console will permit remote operation of all fourteen substations. The plan is to locate the dispatcher's console at West Portal in the same room with the Muni Central Control in order to achieve maximum speed and safety of LRV and trolley coach operations.

The Control and Communication project also includes a special telephone system which will be installed at

wayside locations in the subway and tunnels for use by maintenance personnel in communicating with the power dispatcher.

Electrification of the Market Street Subway and the Twin Peaks and Sunset Tunnels

The Municipal Railway will use the upper of two tunnels which are being constructed under Market Street, the lower to be used by the Bay Area Rapid Transit District (BART). The Electrification Project will place power feeder cables and trolley wire in the Subway for operation of the new LRVs, thus replacing the present streetcars which now run on the surface.

This project will also provide for feeder cables in the Twin Peaks and Sunset Tunnels, as well as the necessary modifications to the existing trolley wire required for the pantograph-equipped LRVs.

Trolley Wire on Surface Streetcar Lines

An extensive modification project is being planned to convert the existing trolley wire system on the surface streets for the pantograph-equipped LRVs. This work will include the installation of new means of support for proper operation of the pantograph, revisions in the track switch operating mechanisms, the replacement of trolley wire for proper current-carrying capacity, and adjustments in trolley wire height.

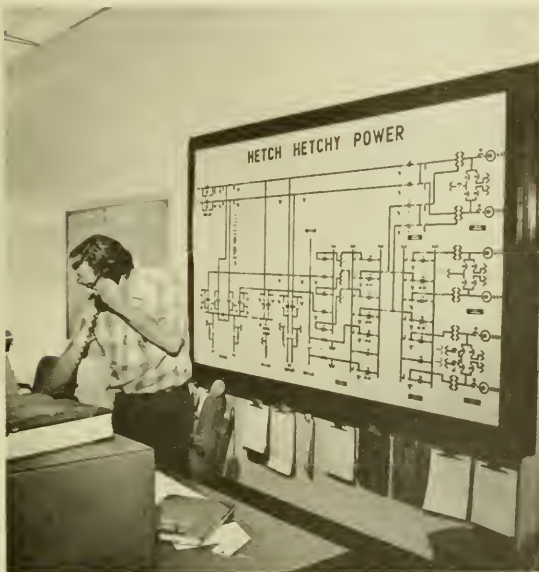


TURK SUBSTATION

The Turk Substation (on the right in the above picture) is one of those being replaced. Its overhead power feeder cables are among those which will be moved to underground ducts.

HETCH HETCHY ENGINEERING

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project and the Transit Power Division. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Scheduling of new facilities, construction and major maintenance is done by the Engineering Division. Specifications for procurement of major or unusual items of equipment are also prepared by the Division. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications. Recommendations as to the firms which are so qualified are made by the Engineering Division. Upon approval of a firm by the Public Utilities Commission, the Division prepares the necessary agreements and contracts, and reviews and approves the work of the consultants.



Power System Status Display
Board

The Engineering Division is organized into four main sections; Structural and Civil, Electrical and Mechanical, Architectural, and Construction. A new section to handle the Power Improvement Program is now being organized.

The Federal grant of \$19.8 million for the Power Improvement Program was approved by UMTA; notification was received on April 16, 1973 and shortly thereafter selection procedures for engineering design consultants were started.

Engineering design contracts will include electrification of the Market Street Subway and Twin Peaks Tunnel; construction of substations and installation of rectifier substation equipment; and power system supervisory control system and subway maintenance telephone system. A selection board comprised of Hetch Hetchy staff members conducted interviews in May, with 19 engineering firms, to determine their qualifications as design consultants for portions of the Program. Formal "Requests for Proposal" were prepared and sent early in June to the firms considered for final selection.

Technical specifications for the transit power substation equipment were completed by Bechtel. The specifications and bid documents for the transit power substation equipment are being prepared for the City Purchaser.

The final Report and Conceptual Design, Phase III, for the Power Improvement Program was received from Bechtel on April 24, 1973. The report was reviewed and minor revisions, concerning the Sunset tie-line assumptions, were requested from Bechtel.

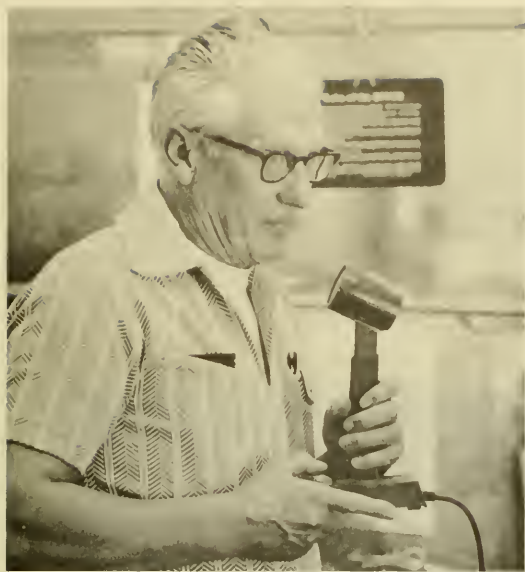
The first of monthly coordination meetings of the joint staffs of Transit Improvement Program and Power Improvement Program was held in May.

Meetings were attended with the Mayor's Transit Task Force to coordinate BART's proposals affecting the transit power facilities.

A program was initiated for undergrounding projects wherein existing overhead pole-supported electrical feeders are to be removed and replaced in new underground duct systems. Three squads of Hetch Hetchy engineers and draftsmen were assigned various projects with particular emphasis and priorities placed on the feeders for the new streetcars.



DIANA B. WHITEMAN
Stenographic Secretary



HAROLD W. EATON
Superintendent, Machine Shop

It is anticipated that approximately \$15 million will be expended to complete all of the undergrounding presently contemplated.

During the year, plans and specifications were prepared for the following work:

HH-450 - Manometer Servo
Cherry Valley Dam

To facilitate remote display and recording of the reservoir level in Lake Lloyd with great accuracy, and to make radio transmittal reservoir level to Moccasin possible, a manometer servo was installed in Cherry Valley Dam.

HH-454 - Reconstruct Moccasin Sewage Disposal System

A package sewage treatment plant producing a better quality odorless effluent and sludge has been planned to replace the existing septic tank system. A Federal "Clean Water Grant" is being applied to cover a substantial portion of the cost of construction of the project. A feasible site for the sprinkler field, as required by the State Water Quality Board, has been selected. Negotiation to acquire the land for the sprinkler field is underway.

HH-467 - Holm Powerhouse Penstock Protection

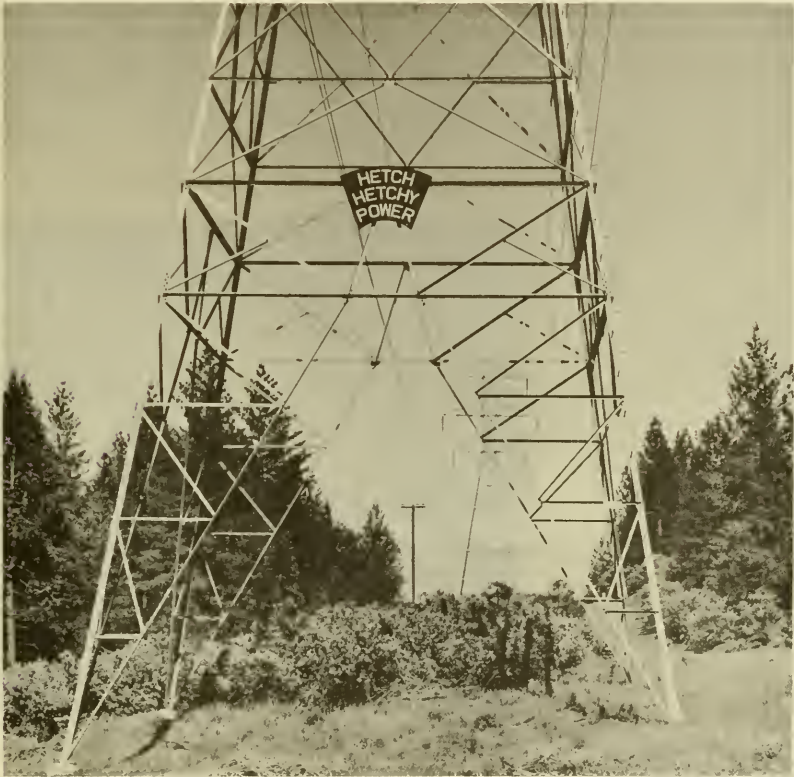
Work under this contract consists of removing rock slides from the penstock trench; installing rock bolts and reinforced gunite on the cut slopes of the trench to prevent further rock fall; and painting the steel penstock where required. The penstock was completed in 1960 and is located on a very steep hillside. The high pressure penstock, if damaged by falling rock, would necessitate closing down the Holm Powerhouse and cause a loss of revenue to the City.

HH-470 - O'Shaughnessy Dam - Replace D-C Switchboard

A contract was let to replace existing open live front type d-c switchboard, which is unsafe, with a new dead-front type switchboard.

HH-471 - Replace, Repair and Paint Steel Trolley Poles

Plans and specifications providing for replacing, painting and repairing trolley poles on Mission Street, an area of the City having a high incidence of corrosion, were completed. This work is part of a proposed program to rehabilitate all steel trolley poles in the City.



MOCCASIN-INTAKE TRANSMISSION LINE TOWERS

HH-472 - South Fork Maintenance Yard - Install Concrete Floor

A new concrete floor slab has been constructed under this contract to replace the existing old and deteriorated gravel floor. This will provide better working space and storage areas for the purpose of maintenance and operation.

HH-473R - Kirkwood Powerhouse Standby Pump for Bearing Cooling Water

To ensure continuous operation of the generators in Kirkwood Powerhouse, should one cooling water pump fail, a standby pump was installed to carry the pumping load during the repair period.

HH-475 - San Joaquin Pipelines, Encasement at Highway 99

Plans and specifications were completed for constructing concrete encasements around three existing San Joaquin pipelines located under the proposed State Highway 99 crossings and related ramps. The encasement will protect the pipelines from increased loads due to heavy traffic and high embankment over the pipes. Cost of encasement will be borne by the State Division of Highways.



CHARLES J. GIANOLA
Superintendent of Operations

HH-476 - Moccasin-Newark
Transmission Lines -
Relocate Towers at
Highway 99

Plans and specifications were completed for relocating transmission line towers which conflict with the proposed State Highway 99 crossings and related ramps. Cost to relocate the towers will be borne by the State Division of Highways.

HH-485 - Moccasin-Newark
Transmission Line - Paint Steel
Towers

These are part of a continuous program of preventive maintenance to paint about 25 steel towers per year.

Moccasin Spillway Study

Moccasin Spillway is scheduled to be modified to increase the storage capacity of Moccasin Reservoir, and an energy dissipator is to be constructed at the lower end of the spillway to withstand a 1,000-year flood. To confirm the discharge characteristics of the modified spillway and the performance of the energy dissipator, model studies are being performed by Dr. Rudavsky at the laboratory of Hydro Research Science at Sunnyvale, California. Results of these studies will be used in the design of the project.

San Joaquin Pipelines No. 1 and No. 2

Inspection of the full length of San Joaquin Pipelines No. 1 and No. 2, to check the condition of the interior of the pipes, was made from April 3, 1972 through April 13, 1973.

The interior of Pipeline No. 1 was found to be in very good condition. No appreciable wear of the invert was indicated.

The interior of reinforced concrete pipe sections of Pipeline No. 2 was found to be, in general, in good condition. The steel pipe sections were in poor condition, particularly at the invert. The lining of these sections was eroded continuously along the invert with bare metal exposed at many locations. Recommendation has been made that this invert lining be repaired in the near future.

The Engineering Division continued to work closely with Bechtel Corporation to determine operating and design criteria for the new system and to provide basic data on the present system.

Monthly generating schedules were prepared for the optimum operation of Holm, Kirkwood and Moccasin hydroelectric plants. Metering and billing were performed for industrial electric power customers of Hetch Hetchy, including the Modesto and Turlock Irrigation Districts.

Numerous meetings and conferences were attended with the Transit Task Force and BARTD to discuss and resolve the many problems of the Municipal Railway power facilities' coordination with BARTD and with the Market Street beautification program.

The Construction Section provided field surveys, construction inspection and contract administration for some eighteen contracts and projects as tabulated hereinafter.



STREET LIGHTING ON O'SHAUGHNESSY
BETWEEN PORTOLA AND VALE AVENUE

BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 41.4% owned by the City; 5.6% owned by the Pacific Gas and Electric Company and, a small percentage, 1.9%, jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 80.2% of the lights are City-owned. Five years ago, the corresponding figure was 67.3%.

In fiscal 1933-34, the cost for street lighting was \$1.25 per capita; last year, with approximately thirty times as much light on the streets and public thoroughfares, the cost per capita was approximately \$1.92.

Maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Bureau. A second contract covered work required for repair of damaged and defective equipment, painting and miscellaneous maintenance.

Under contract, the Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned street light operation was supplied by the Hetch Hetchy power system.

Street Lighting Engineering

The Bureau reviews, recommends changes, approvals or rejections, and correlates all street lighting installations, including that done by the Department of Public Works, the Pacific Gas and Electric Company, the Bay Area Rapid Transit District, the State of California, subdividers, etc.

During the fiscal year 1972-73, 25 street lighting contracts involving a total of 468 new street lights were approved by the Public Utilities Commission. Plans were submitted for approval only after careful checking to determine that illumination will exceed the minimum requirements established by the American National Standards Institute; and that all materials used, and manner of installation, meet with the applicable local, state and federal rules, regulations and statutes governing the installation of electrical work.

Operation and Maintenance

As of June 30, 1973, a total of 36,812 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and types of units in service at the end of the fiscal year is shown in Appendix Table 14.

A total of \$1,248,957 was expended for operation, maintenance and repair of the street lighting system. Of the total cost, \$12,107 was paid by the State for its share of the operation and maintenance of street lighting at intersections on City streets, which are part of the State highway system.

During the fiscal year, there were 118 accidents involving damage to City-owned street lighting property. Investigation was made, as soon as possible, to remove hazards to the public and obstructions to traffic. Total cost of repairs to damaged City-owned street lighting property was \$56,028. Every effort was made to secure reimbursement for damages incurred from the responsible parties. Previous experience indicates that approximately three-fourths of the repair costs will be recovered.

Complaints

During the year, 63 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and requests for temporary and permanent relocation of street lighting poles.

Improvements

During the fiscal year 1972-73, a total of 406 new City-owned street lights were placed in service at a cost of \$415,614. Improvements were financed by State Gasoline Tax, as indicated in Appendix Tables 16 and 17.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments are furnished by the Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year, 508,259,909 kilowatthours of electrical energy were consumed through 943 municipal accounts at an expenditure of \$5,111,026. A saving of \$1,358,628 was realized as a result of purchasing Hetch Hetchy energy as compared to commercial rates. Of the above, 177,310,590 kilowatthours of energy were supplied to the San Francisco International Airport for resale to tenants at a cost of \$1,508,054. During the past ten years, electrical consumption for municipal purposes has increased by 86 percent.

Natural gas consumption was 18,711,224 therms through 548 accounts at a cost of \$1,205,572. One account consumed 2,235,400 pounds of steam at a cost of \$4,338. There were six increases in gas rates last year which increased the cost to municipal accounts by approximately \$70,000. This was partially offset by a gas refund of \$17,347.65.

A summary of consumption and expenditures for these commodities is shown in Tables 12 and 13.

A P P E N D I X

TABLE 1

HETCH HETCHY WATER AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)

FISCAL YEAR 1972-73

OE	DESCRIPTION	BUDGET	ACTUAL	-UNDER, OVER
110	Permanent Salaries	\$ 628,043	\$ 614,738	\$ -13,305
111	Overtime	18,000	18,292	292
112	Holiday Pay	5,000	4,994	-6
113	Extended Work Week	2,600	2,598	-2
120	Temporary Salaries	44,000	42,499	-1,501
130	Wages	1,246,405	1,201,344	-45,061
139	Wages - Gardeners	42,770	42,080	-690
200	Contractual Service	71,340	70,138	-1,202
216	Maint. and Repair of Auto Equipment	14,700	10,976	-3,724
231-1	Purchase of Power for Resale	3,000,500	2,333,464	-667,036
232-2	Service Charge for Transm. and Dist.	2,355,200	2,290,549	-64,651
251	Subsistence of Employees	9,500	9,025	-475
300	Materials and Supplies	112,870	147,508	34,638
640	Water Rights and Damage Claims	12,000	12,000	-0-
641	Hydrography	31,500	31,198	-302
801	Accident Compensation	19,948	19,948	-0-
812	Fidelity Insurance	53	72	19
813	Automobile Insurance	5,028	8,043	3,015
814	Fire Insurance	10,382	6,989	-3,393
815	Miscellaneous Insurance	12,500	12,178	-322
853	Assessments Paid to Other Districts	96,091	47,755	-48,336
854	Membership Dues	2,841	3,984	1,143
855	Fees to U. S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads and Trails - Raker Act	15,000	15,000	-0-
860	Retirement Allowance	298,591	259,524	-39,067
862	Social Security	82,715	75,685	-7,030
865	Health Service System	15,092	14,797	-295
870	Taxes	441,473	441,473	-0-
880	Rental - Transmission Lines and Offices	122,400	122,400	-0-
900	Services of Other Departments	882,985	882,985	-0-
	TOTAL OPERATION AND MAINTENANCE	\$ 9,629,527	\$ 8,772,236	\$ -857,291
400	Equipment	39,505	38,170	-1,335
500	Additions and Betterments	353,807	353,807	-0-
700	Reconstruction and Replacement	279,828	279,828	-0-
800	Bond Interest and Redemption	8,095,378	8,041,359	-54,019
	TOTALS	\$ 18,398,045	\$17,485,400	\$ -912,645

TABLE 2
HETCH HETCHY WATER AND POWER
TAXES
FISCAL YEAR 1972-73

<u>Tax Levying Bodies</u>	<u>Assessed Value</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 1,800.00	\$ 207.00
San Joaquin County	36,525.00	4,108.50
San Mateo County	3,105.00	339.26
Stanislaus County	99,230.00	10,348.62
Tuolumne County	4,872,453.00 (a)	425,145.86
Banta-Carbona Irrigation District	2,893.40	124.42
Oakdale Irrigation District	24,640.00	1,108.80
West Stanislaus Irrigation District	<u>1,800.00</u>	<u>90.00</u>
	\$5,042,446.40	\$ 441,472.46

(a) Includes \$3,953,280 assessment for water rights.

TABLE 3

TRANSIT POWER DIVISIONMOTIVE POWER SECTION - SUBSTATIONS

<u>Substation</u>	<u>Type (a)</u>	<u>Date Installed</u>	<u>No. of Units</u>	<u>KW Size</u>	<u>Fiscal Year 1972-73</u>	
					<u>Max. Loan in KW</u>	<u>KWH Converted to 600 V d-c</u>
Bryant	M-G	1910	3	1500	2304	6,252,600
	M-G	1910	(b) 2	1500		
Turk	M-G	1910	3	1500	4644	9,107,400
	M-G	1910	(b) 2	1500		
Downtown	SC	1921	2	2000	3510	8,481,000
	SC	1924	1	3000		
Eight Avenue	SC	(c) 1921	1	1500	1384	3,691,200
	SC	(c) 1921	(b) 1	1500		
	SC	1924	1	2000		
West Portal	MAR	1951	1	2000	2420	6,632,000
Outer Mission	MAR	1953	1	750	830	2,347,000
Geneva	M-G	1910	3	1500	1580	128,500
						<u>36,639,700</u>

Notes: (a) Type of Conversion Equipment:

M-G = Motor-Generator

SC = Synchronous Converter

MAR = Mercury Arc Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES

FISCAL YEAR 1972-73

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>UNDER, OVER</u>
110-1	Permanent Salaries	\$ 87,432	78,030	- 9,402
130-1	Wages	928,175	841,794	- 86,381
300-1	Materials and Supplies	53,000	40,820	- 12,180
801-1	Accident Compensation	13,299	13,299	-0-
860-1	Retirement Allowances	130,490	122,166	- 8,324
862-1	Social Security	36,197	33,214	- 2,983
865-1	Health Service System	<u>6,604</u>	<u>6,475</u>	<u>- 129</u>
	TOTAL OPERATION AND MAINT.	\$1,255,197	1,135,798	-119,399
400	Equipment	3,815	3,645	- 170
500-1	Additions and Betterments	-0-	-0-	-0-
700-1	Reconstruction and Replacements	<u>1,065,300</u>	<u>1,065,300</u>	<u>-0-</u>
	TOTAL	<u><u>\$2,324,312</u></u>	<u><u>2,204,743</u></u>	<u><u>-119,569</u></u>

TABLE 5
HETCH HETCHY WATER AND POWER
SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1972-73

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
Revenue from Sale of Electrical Energy	\$ 13,400,000	\$ 14,662,650	\$1,262,650
Revenue from Sale of Water and Standby Charge, SFWD	5,500,000	5,500,000	-0-
Other Revenue	<u>77,600</u>	<u>106,601</u>	<u>29,001</u>
	\$ 18,977,600	\$ 20,269,251	\$1,291,651
 <u>EXPENDITURES</u>			
Total Expenditures	\$ 20,722,357	\$ 19,690,143	\$-1,032,214
 <u>EXCESS OF REVENUE OVER EXPENDITURES</u>			
	<u>\$-1,744,757</u>	<u>\$ -579,108</u>	<u>\$ 2,323,865</u>

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

<u>SEASON PRECIPITATION (INCHES)</u>	<u>Normal</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>	<u>1972-73</u>
Hetch Hetchy	34.10	56.24	35.07	29.95	24.84	35.97
Lake Lloyd	46.57	76.45	51.95	41.94	32.77	46.03
Approx. Percent of Normal	100%	164%	108%	89%	71%	102%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	728,075	1,157,000	889,700	681,600	584,400	780,798
Lake Lloyd)	425,548	704,300	518,400	409,100	331,800	447,358
Lake Eleanor)						
Total	1,153,623	1,861,300	1,408,100	1,090,700	916,200	1,228,157
Approx. Percent of Normal		161%	122%	95%	79%	106%
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>	<u>No-Spill</u>					
	<u>Capacity</u>					
Hetch Hetchy	360,360	349,575	357,208	356,617	324,530	362,736
Lake Lloyd	268,800	260,021	243,854	199,983	151,653	217,872
Lake Eleanor	27,100	24,286	27,016	27,403	2,110	27,016
Total	656,260	633,882	628,078	584,003	478,293	607,624
<u>DELIVERY TO SFD (ACRE-FT.) (a) (b)</u>						
Average per day		562	565	578	702	585
Maximum per day		853	856	748	856	850
Total for fiscal year		205,426	206,514	210,992	257,046	213,684
Total since operation of Hetch Hetchy Aqueduct began in 1934 4,143,554						

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
(b) Includes delivery to Livermore site, U.S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1972-73

<u>PLANT DATA</u>	<u>Nameplate Rating</u> <u>(Kilowatts)</u>	<u>Capability</u> <u>(Kilowatts)</u>	<u>Annual Plant</u> <u>Factor - %</u>
Moccasin Powerhouse	90,000	104,000	59.7
Dion R. Holm Powerhouse	135,000	150,000	49.8
Robert C. Kirkwood Powerhouse	<u>67,500</u>	<u>85,000</u>	80.9
Total	292,500	339,000	
<u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse		543,830,000	
Dion R. Holm Powerhouse		654,197,000	
Robert C. Kirkwood Powerhouse		<u>602,024,000</u>	1,800,051,000
<u>Station Service</u>			
Moccasin Powerhouse		943,800	
Dion R. Holm Powerhouse		1,055,430	
Robert C. Kirkwood Powerhouse		<u>876,110</u>	2,875,340
<u>Net Generation</u>			1,797,175,660
<u>Supplementary Energy</u>			
"Bank" Withdrawal*		0	
Purchase (PG&E Co.)		<u>351,288,448</u>	<u>351,288,448</u>
<u>Total</u>			<u>2,148,464,108</u>
<u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts		508,259,909	
Modesto Irrigation District		858,816,000	
Turlock Irrigation District		421,484,000	
Kaiser Cement and Gypsum Corporation		145,368,000	
Kaiser Aluminum and Chemical Corporation		31,521,600	
Norris Industries, Inc.		22,325,760	
Miscellaneous Customers		<u>847,858</u>	1,988,623,127
<u>Non-Revenue</u>			
Project Use		4,003,796	
"Bank" Deposit*		<u>28,985,698</u>	32,989,494
<u>Losses</u>			
Hetch Hetchy System		48,007,846	
PG&E System (Municipal and Industrial Accounts)		<u>78,843,641</u>	<u>126,851,487</u>
<u>Total</u>			<u>2,148,464,108</u>

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 8

HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS

FISCAL YEARS 1971-72 AND 1972-73

(Nearest 100,000 Kilowatthours)

<u>CUSTOMER</u>	<u>1971-72</u>	<u>1972-73</u>
Municipal Accounts		
International Airport	199,800,000	216,800,000
Municipal Railway	61,900,000	61,700,000
Public Works	24,800,000	26,400,000
Street Lighting	44,500,000	45,400,000
Unified School District	37,100,000	38,400,000
Water Department	40,400,000	44,400,000
Other City Departments	69,600,000	75,200,000
Modesto Irrigation District	796,700,000	858,800,000
Turlock Irrigation District	360,600,000	421,500,000
Kaiser Cement and Gypsum Corp.	152,100,000	145,400,000
Kaiser Aluminum and Chemical Corp.	34,000,000	31,500,000
Norris Industries, Inc.	17,700,000	22,300,000
Hercules, Inc.	57,900,000	-
California Ammonia Company	80,900,000	-
Miscellaneous Customers	<u>800,000</u>	<u>800,000</u>
TOTAL	1,978,800,000	1,988,600,000

TABLE 9

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1971-72 AND 1972-73
(Nearest \$1,000)

<u>CUSTOMER</u>	<u>1971-72</u>	<u>1972-73</u>
Municipal Accounts		
International Airport	\$ 1,635,000	\$ 1,781,000
Municipal Railway	626,000	623,000
Public Works	307,000	319,000
Street Lighting	471,000	480,000
Unified School District	549,000	572,000
Water Department	362,000	402,000
Other City Departments	850,000	933,000
Modesto Irrigation District	4,640,000	5,069,000
Turlock Irrigation District	2,163,000	2,601,000
Kaiser Cement and Gypsum Corp.	1,337,000	1,348,000
Kaiser Aluminum and Chemical Corp.	324,000	305,000
Norris Industries, Inc.	193,000	220,000
Hercules, Inc.	434,000	-
California Ammonia Company	602,000	-
Miscellaneous Customers	<u>9,000</u>	<u>9,000</u>
TOTAL	\$14,502,000	\$14,662,000

TABLE 10

HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

NET GENERATION		1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Moccasin Powerhouse		528,512,500	465,854,212	493,702,900	531,070,800	533,978,200	542,886,200
Dion R. Holm Powerhouse		733,220,320	944,664,850	887,037,320	892,230,400	808,515,430	653,141,570
Robert C. Kirkwood Powerhouse		613,159,620	598,681,120	615,542,120	630,874,100	614,151,930	601,147,890
Subtotal		1,874,892,440	2,009,200,182	1,996,282,340	2,054,175,300	1,956,645,560	1,797,175,660
SUPPLEMENTAL ENERGY							
"Bank" Withdrawal**		116,276,026	81,906,642	191,365,500	133,964,745	46,360,466	0
Purchase (PG&E Co.)		0	40,798,879	0	46,097,953	108,734,434	351,288,448
Subtotal		116,276,026	122,705,521	191,365,500	180,062,698	155,094,900	351,288,448
TOTAL		<u>1,991,168,466</u>	<u>2,131,905,703</u>	<u>2,187,647,840</u>	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>
DISTRIBUTION							
Sales							
Municipal Accounts		388,836,371	412,201,831	427,168,499	458,127,155	478,105,789	508,259,909
Modesto Irrigation District		557,184,000	597,864,000	637,972,000	728,371,000	796,740,000	858,816,000
Turlock Irrigation District		248,457,600	263,616,000	271,156,800	321,456,000	360,619,200	421,484,000
Kaiser Cement & Gypsum		175,655,640	173,061,180	168,705,080	152,736,000	152,127,205	145,368,000
Kaiser Aluminum & Chemical		24,334,411	30,744,000	39,240,000	39,549,000	33,996,000	31,321,600
Norris Industries, Inc.		60,637,939	35,914,140	35,721,216	24,033,485	17,664,768	22,325,760
Dow Chemical Company		75,829,720	23,582,132	---	---	---	---
Hercules, Inc.		112,338,000	97,776,000	92,844,000	94,662,000	57,906,000	---
Shell Chemical Co.		50,570,000	---	---	---	---	---
California Ammonia Co.		100,845,672	101,720,736	103,020,000	104,280,480	80,876,760	---
Air Products & Chemicals		20,762,304	32,930,496	34,617,984	32,653,056	---	---
Valley Nitrogen Producers		---	28,675,920	124,884,480	108,631,560	---	---
Miscellaneous Customers		1,046,804	1,016,562	664,093	745,614	759,065	847,858
Non-Revenue							
Project Use		3,468,127	3,787,748	3,744,004	4,101,136	4,287,512	4,003,796
"Bank Deposit"*		60,324,204	205,895,527	135,151,010	47,826,652	9,756,928	28,985,698
Losses		<u>111,877,674</u>	<u>102,119,431</u>	<u>112,758,674</u>	<u>117,064,260</u>	<u>118,901,233</u>	<u>126,851,487</u>
TOTAL		<u>1,991,168,466</u>	<u>2,131,905,703</u>	<u>2,187,647,840</u>	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1972-73

<u>OE</u>	<u>DESCRIPTION</u>	<u>EXPENDITURES</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER +OVER</u>
110	Permanent Salaries		\$ 147,103	\$ 121,475	-25,628
111	Allowance for Overtime		600	250	- 350
112	Holiday Pay		300	300	-
200	Contractual Services		1,050	557	- 493
231	Lighting and Heating of Public Buildings - General		1,238,895	1,255,524	+16,629
231-1	Lighting and Heating of Public Bldgs. - Special Fund		4,603,207	4,578,336	-24,871
231-2	Lighting of Public Streets - Pacific Gas and Electric Co.		545,955	613,680	+67,725
231-3	Lighting of Public Streets - Hetch Hetchy		470,944	467,607	- 3,337
231-4	Lighting of Public Streets - Calif. Division of Highways		1,000	1,000	-
300	Materials and Supplies		475	503	+ 28
400	Equipment		600	517	- 83
813	Auto Insurance		500	257	- 243
860	Retirement Allowance		16,808	12,547	- 4,261
862	Social Security		5,333	3,060	- 2,273
865	Health Service System		1,640	927	- 713
954	EDP - PUC Data Processing		12,000	12,000	-
	TOTAL		<u>\$7,046,410</u>	<u>\$7,068,540</u>	<u>+22,130</u>

RECEIPTS

Interfund Receipts*	\$5,679,668	\$5,673,674	- 5,994
Ad Valorem Taxes	<u>1,366,742</u>	<u>1,394,866</u>	<u>+28,124</u>
	<u>\$7,046,410</u>	<u>\$7,068,540</u>	<u>+22,130</u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

<u>DESCRIPTION</u>	<u>TOTAL FUNDS</u>	<u>EXPENDITURE</u>	<u>-UNDER +OVER</u>
Maintenance and Repair of Street Lighting Installations	\$ 161,000	\$ 165,572	+ 4,572

*Transfers from other departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER
EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1972-73

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION KILOWATT-HOURS	EXPENDITURES
Adult Probation	1	19,011	461
Art Museum	1	853,356	9,478
Auditorium and Brooks Hall	1	4,972,800	52,087
Child Care Centers	10	242,910	5,564
City Planning	1	75,120	1,547
DeYoung Museum	1	2,748,800	27,214
Disaster Corp.	2	1,918	1,865
Electricity	5	460,079	7,974
Farmer's Market	1	16,950	413
Fire (a)	58	3,110,015	62,500
Hassler Health Home	1	265,400	3,902
Health	23	15,302,715	145,978
Hetch Hetchy	6	173,744	4,429
Hidden Valley Ranch	1	900,960	10,213
International Airport (b)	8	216,819,821	1,780,887
Junior College District	14	7,687,046	80,465
Legion of Honor	1	435,200	5,888
Library	31	2,775,361	46,295
Log Cabin Ranch	13	398,571	11,003
Municipal Railway	37	61,670,836	623,201
Parking Authority	18	177,903	4,297
Police	17	750,003	15,152
Public Buildings	9	17,003,176	145,363
Public Works	72	25,910,198	313,035
Purchasing	5	524,087	7,760
Real Estate (e)	1	0	724
Recreation and Park	203	11,299,289	194,964
Recreation and Park - Candlestick Park	2	2,081,560	46,549
Recreation and Park - Yacht Harbor	33	1,306,299	27,935
Sheriff	3	1,605,800	16,202
Social Services	7	1,241,198	16,811
Street Lighting Operations (.003)	0	45,357,336	467,608
Unified School District	229	31,395,289	491,925
War Memorial	1	1,343,444	16,781
Water	120	44,419,923	401,880
Youth Guidance	3	1,528,766	15,481
TOTAL MUNICIPAL DEPARTMENTS	939	504,874,884	5,063,831
Academy of Sciences	2	3,074,566	27,750
Mount Davidson Cross Lighting	0	(c)	1,200
State of California: Street Lighting	1	(d)	12,107
Traffic Devices	1	310,459	6,138
TOTAL FROM HETCH HETCHY	943	508,259,909	5,111,026
Fire Department, For Resale to Fort Mason	1	2,892,568	36,606
GRAND TOTAL	944	511,152,477	5,147,632

- NOTES: (a) Electricity purchased for resale to Fort Mason excluded.
 (b) Includes 177,310,590 KWH resold at Commercial rates for \$1,508,054 to Airport tenants.
 (c) Included under Recreation and Park.
 (d) Included under Street Lighting Operations.
 (e) Estimated Bill.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1972 - 1973

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURE</u>
Adult Probation	1	855	75
Auditorium and Brooks Hall	2	900	97
Child Care Centers	8	27,602	2,178
City Planning	1	4,753	368
De Young Museum	1	274,724	19,706
Disaster Corp.	1	202	30
Electricity	2	53,658	3,921
Farmer's Market	1	722	69
Fire	57	702,506	50,631
Hassler Health Home	3	42,357	3,096
Health	25	5,078,964	273,018
Hetch Hetchy	2	1,987	208
International Airport	6	1,572,514	92,183
Junior College District	9	843,004	55,394
Legion of Honor	1	66,973	4,755
Library	28	106,430	8,314
Municipal Railway	12	310,426	23,440
Police	10	38,121	2,976
Public Buildings	5	1,446,881	88,131
Public Works	15	325,610	27,226
Purchasing	3	62,720	4,459
Recreation and Park	106	1,318,642	94,767
Recreation and Park-Candlestick Park	1	114,083	8,187
Registrar of Voters	1	10,318	779
Sheriff	2	454,676	28,448
Single Men's Rehabilitation Center	1	33,662	2,296
Social Services	4	76,122	5,573
Unified School District	218	4,716,152	337,112
War Memorial	3	242,584	17,503
Water	13	191,223	14,142
Youth Guidance	4	447,676	27,616
TOTAL MUNICIPAL DEPARTMENTS	546	18,567,047	1,196,698
Academy of Sciences (a)	2	144,177	8,874
GRAND TOTAL	548	18,711,224	1,205,572

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Social Services	1	2,235,400	4,338

(a) Billed directly by PGandE after January 1973

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1973

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY- OWNED</u>	<u>JOINTLY- OWNED</u>	<u>CITY- OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500 " "	255	24	107	386
4,000 " "	1,071	129	1,707	2,907
6,000 " "	585	457	3,171	4,213
10,000 " "	450	21	550	1,021
23,000 " Fluorescent	---	---	---	---
400-Watt Mercury Vapor	5	43	170	218
1,000 " "	---	---	3	3
175-Watt Mercury Vapor	---	---	10	10
250 " "	2	---	---	2
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	107	107
2,500 " "	13	4	67	84
4,000 " "	192	2	78	272
6,000 " "	40	5	82	127
10,000 " "	10	---	15	25
5,500 " Fluorescent	---	---	38	38
23,000 " "	39	---	2	41
100-Watt Mercury Vapor	---	---	112	112
175 " "	45	---	2,936	2,981
250 " "	34	---	967	1,001
400 " "	303	---	4,494	4,797
700 " "	---	---	362	362
1,000 " "	---	---	139	139
400 " Lucalox	---	---	21	21
448 " Incandescent	---	---	78	78
<u>OVERHEAD CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	2	---	---	2
4,000 " "	29	---	---	29
6,000 " "	---	---	---	---
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	13	---	---	13
4,000 " "	49	---	11	60
6,000 " "	4	---	1	5
175-Watt Mercury Vapor	14,842	---	1	14,843
250 " "	1,958	---	---	1,958
400 " "	935	---	---	935
TOTAL, JUNE 30, 1973	<u>20,876</u>	<u>707</u>	<u>15,229</u>	<u>36,812</u>
	56.7%	1.9%	41.4%	100%
TOTAL, JUNE 30, 1972	21,043	956	14,593	36,592
NET CHANGE DURING THE YEAR	-167	-249	+636	+220

TABLE 15

BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1972-73

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	815,875		
Jointly-owned facilities (a)	34,015		
City-owned facilities (b)	142,794	992,684	
Less deduction for energy component		423,889	568,795
Emergency service to City-owned facilities			3,320

Lease-Lite Corporation

Group lamp replacement - City-owned facilities			45,972
--	--	--	--------

MAHONEY ELECTRIC

Maintenance and repair - City-owned facilities			
Routine maintenance		40,792	
Repair of damage caused by accidents (c)		35,205	
Repair of damage caused by equipment failure		26,162	
Repair of damage caused by vandals		2,397	104,556

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	20,823		
Damage caused by equipment failure	8,323		
Damage caused by vandals	869		30,015

ELECTRIC ENERGY (HETCH HETCHY)

45,357,336 kWh @ \$0.01345 less 21% discount			481,944
--	--	--	---------

TOTAL EXPENDITURE			1,234,602
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LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway routes	12,107		
Recreation and Park Dept. for off-street lighting	2,248		14,355

TOTAL NET EXPENDITURE			<u>1,248,957</u>
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AVERAGE OPERATING COST

Based on number of lights in service June 30, 1973, average total cost of operation, maintenance and repair per light per year:

33.93

NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.

(b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.

(c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16
BUREAU OF LIGHT, HEAT AND POWER
NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1972-73

<u>Location</u>	<u>Number of Lights</u>	<u>Value</u>
Alamo Square, Contract No. 2	24	\$ 10,120
Army Street Circle Contract No. 4	7	11,338
Army Street Circle Contract No. 5	5	4,895
Cow Hollow Area, Contract No. 1	40	56,636
Divisadero, Calif. to Post (Lums. only)	98	21,511
Fifth & Seventeenth Avenues	7	6,206
Fifth Street Extension	6	8,449
Francisco-Hyde Area	12	36,606
Golden Gate Heights Contract No. 2	7	9,394
Laguna Street, Golden Gate to Turk	5	7,369
Lincoln Way, 8th to 18th Avenue	44	36,055
O'Shaughnessy, Portola to Elk	56	80,000
Redevelopment Area A-2, Contract "D"	17	20,450
Redevelopment Area A-2, Contract "E"	60	82,249
Redevelopment Area E-1, Contract "L"	8	11,471
Russian Hill, Stage III, Contract No. 2	3	2,765
Washington Street, Kearny to Montgomery	2	1,600
Webster, Grove to Ivy	5	8,500
	<hr/>	<hr/>
TOTAL	406	\$415,614

- NOTES: 1. The above lights are all mercury vapor units.
2. The above projects were all financed by State Gasoline Tax.

TABLE 17
BUREAU OF LIGHT, HEAT AND POWER
HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to July 1, 1953	\$1,748,675	\$ 617,115	-	\$576,404	\$ 22,650	\$ 477,651	\$ 3,442,495
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	155,727	30,817	-	748	16,578	543	204,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	538	182,762
1959-60	-	100,126	-	35,874	10,242	4,083	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	474,673	\$ 522,899	-	-	-	997,572
1966-67	-	111,164	188,312	5,000	-	-	304,476
1967-68	-	175,949	331,941	-	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	-	1,031,201
1969-70	-	359,635	261,000	-	-	-	620,635
1970-71	-	490,031	1,550,442	-	-	-	2,040,473
1971-72	-	541,534	1,810,011	-	-	-	2,351,545
1972-73	-	415,614	-	-	-	-	415,614
Totals	\$2,178,926	\$4,829,107	\$5,281,327	\$878,534	\$197,350	\$ 498,275	\$13,863,519
Less: Cost of portions removed prior to fiscal year 1971-72						\$1,506,323	
Cost of portions removed during fiscal year 1972-73						32,050	
							1,538,373
Original cost of City-owned Facilities in Service on June 30, 1973							\$12,325,146

*Includes WPA and PWA (1953-1942), Boulevard Construction (1932-34), Municipal Railway, Recreation and Park Department and Housing Authority.

TABLE 18

HETCH HETCHY WATER AND POWERCONSTRUCTION CONTRACTS
FISCAL YEAR 1972-73

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time</u>		<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
			<u>Started</u>	<u>Completed</u>		
HH-438	Paint and Remodel Moccasin Administration Building and Dormitory	Chas. I. Cunningham Co.	8- 2-71	11-23-71	23,888	6,187
HH-440R	Painting Steel Trolley Poles	J. Wm. Sorenson	9-27-71	5-16-72	51,240	5,243
HH-442	Motorize Valves - San Joaquin Pipelines Oakdale Portal and Tesla Portal Valve Houses	OBCO Contr. & Engrs.	6- 1-71	99%	28,280	20,430
HH-447	Installation of Post Street Trolley System	Abbett Electric Corp.	10-26-71	1-2-73	265,378	44,087
HH-450	Install Servomanometer Cherry Valley Dam	V. N. Vukasin	12-26-72	6-12-73	28,925	26,727
HH-451R	Compressed Air Services Moccasin Shops	Vetter Plumbing	1-15-73	3-21-73	23,245	23,150
HH-452	Improvements to Storm Drainage System, Moccasin	V. N. Vukasin	8-14-72	10-27-72	57,440	57,053
HH-453	Holm Powerhouse - Paint Interior	G.V.R. Inc.	8-28-72	3- 1-73	29,889	29,889
HH-457	Cottage No. 4 - O'Shaughnessy Dam, Renovate and Repair	Bill Ruckman	5-31-72	8- 4-72	3,622	3,622
HH-459	Replacement of Electric Substation-Alameda Portal Substation	Brayer Electric Co.	4-17-73	9-13-72	9,477	9,477

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1972-73

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Started</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-460	Replace Roadway Lights, Moccasin Dam	Ferrero Electric Co.	9- 5-72	12- 4-72	8,955	8,955
HH-461	Improvements to Domestic Water Supply System at Moccasin	E. H. Morrill Co.	5-22-72	7-11-73	37,824	37,794
HH-462	Install Heating System in Tesla Portal Residence	Sears Roebuck & Co.	7-17-72	8-24-72	1,559	1,559
HH-463	Feeder Cables, Mission St., 2nd to 4th Streets	Abbett Electric Corp.	8- 7-72	5-21-73	37,866	41,651
HH-464	Replace Repair & Paint Steel Trolley Poles	Mahoney Electric Co.	9- 5-72	5-11-73	9,581	9,113
HH-465	Moccasin-Newark 11KV Transmission Lines Painting Steel Towers 15N to 503N	C.C. Knight Painting	9-25-72	11-30-72	23,250	23,250
HH-472	South Fork Maintenance Yard- Install Concrete Floor	George Reed Inc.	6-11-73	7- 9-73	6,920	6,920
Emerg.	Grout Leaks Tunnel & Dam	Pressure Grout Co.	3-12-73	75%	50,000	37,500
Emerg.	Repair Manhole - 2nd & Mission	The Lowrie Paving Co.	6-14-73	7- 3-73	10,000	4,713

Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year:

\$397,320

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1973-74

1973 ANNUAL REPORT 1974

HETCH HETCHY WATER AND POWER



PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO

MOCCASIN POWERHOUSE

CITY AND COUNTY OF SAN FRANCISCO

JOSEPH L. ALIOTO - MAYOR

PUBLIC UTILITIES COMMISSION

H. WELTON FLYNN	President
JOSEPH P. BYRNE	Vice President
OLIVER M. ROUSSEAU	Commissioner
JOSEPH J. DIVINY	Commissioner
HENRY E. BERMAN	Commissioner
JOHN D. CROWLEY	General Manager

ANNUAL REPORT
FISCAL YEAR 1973-74

HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to
Hetch Hetchy employees, past and present,
whose devoted and conscientious efforts have
made possible these accomplishments for
San Francisco



LAKE LLOYD

HIGHLIGHTS - 1973-74

Hetch Hetchy power revenues were \$14,104,677; revenue for sale of water and standby service to the San Francisco Water Department was \$6 million.

Hetch Hetchy's Transit Power Improvement Program for Muni Railway moved into high gear with the selection of two engineering firms as consultants for design of modifications to the overhead wiring system and of new rectifier substations at strategic locations in the City to meet increased power requirements for Muni's new light rail vehicles.

Actual construction on the program commenced with installation of underground ducts on Judah Street and Nineteenth Avenue. Hetch Hetchy staff engineers are working on plans and specifications for other facilities around the City for undergrounding overhead feeder lines to aesthetically improve the San Francisco environment.

\$4.3 million in Hetch Hetchy power revenues were expended this year for the operation, maintenance and improvement of the electrical facilities of the San Francisco Municipal Railway.

Hetch Hetchy furnished power for the Municipal Railway and other City Departments at rates well below those which would have been charged by the Pacific Gas and Electric Company, a further saving to the taxpayers of approximately \$3 million.

A total of 414 new City-owned street lighting electroliers were placed in service at a cost exceeding \$503,000.

HETCH HETCHY ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, the HETCH HETCHY WATER AND POWER DEPARTMENT and the BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.

Through its Transit Power Division, Hetch Hetchy has funded, operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Railway since July 1, 1969.

In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Over-head Lines and Motive Power Sections of the Municipal Railway. Personnel for this division includes fifty-two employees in twelve different categories.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design and construction of City-owned street lighting improvements are under the jurisdiction of the Department of Public Works, and plans for these improvements must be approved by the Public Utilities Commission through this Bureau. The Bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1973-74, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>Number of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	199	\$ 17,000,931
Hetch Hetchy Water and Power (Transit Power Division)	52	4,519,694
Bureau of Light, Heat and Power	<u>11</u>	<u>7,566,046</u>
	262	\$ 29,076,671



LINDA BORRELLI, Payroll and Personnel Clerk
ETTA MAY LETUAL, Account Clerk

HETCH HETCHY WATER AND POWER SYSTEM

REVENUES AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal Departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and four industrial customers:

Kaiser Cement and Gypsum Corporation	Santa Clara County
Kaiser Cement and Chemical Corporation	Santa Clara County
Lockheed Missile and Space Company, Inc.	Santa Clara County
Norris Industries, Riverbank	Stanislaus County

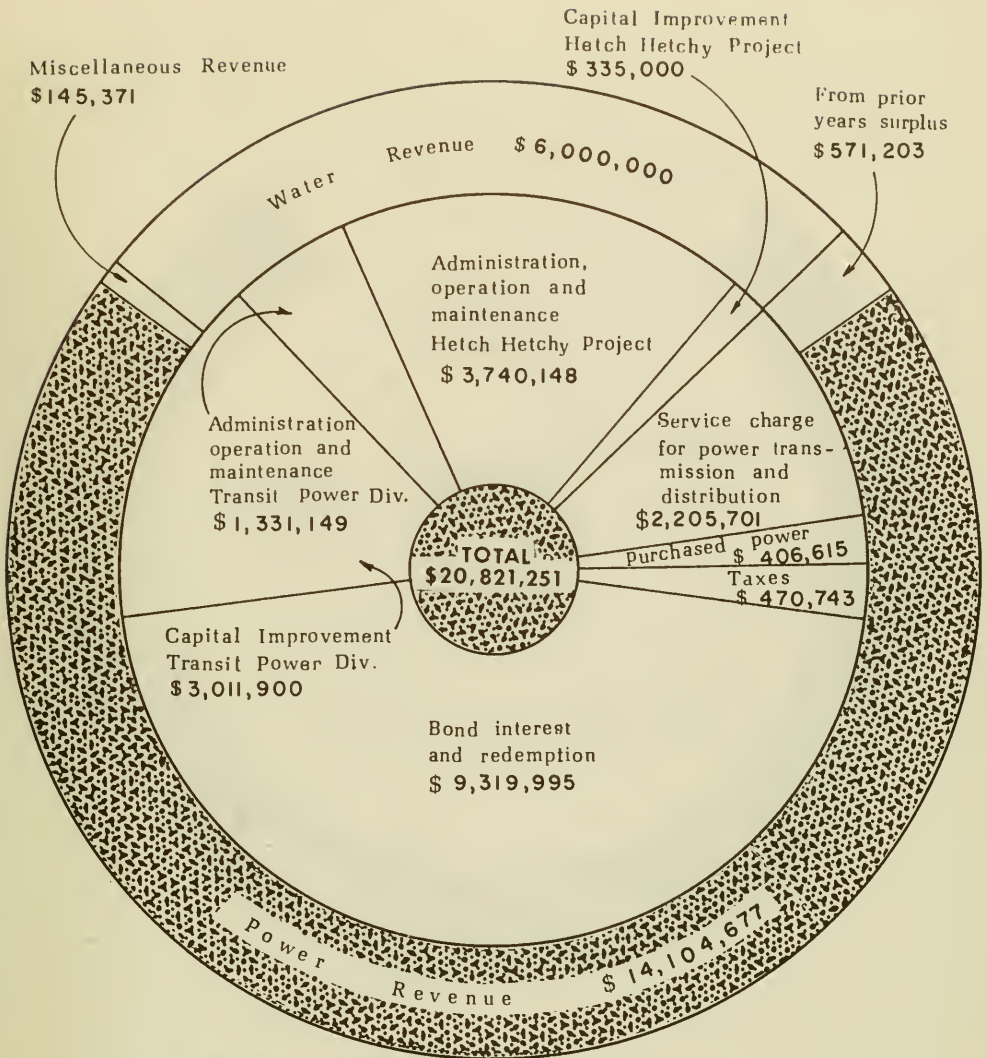
2. Sale of water to the San Francisco Water Department.

This past year, revenue from sale of water and standby service to the San Francisco Water Department totaled \$6 million.

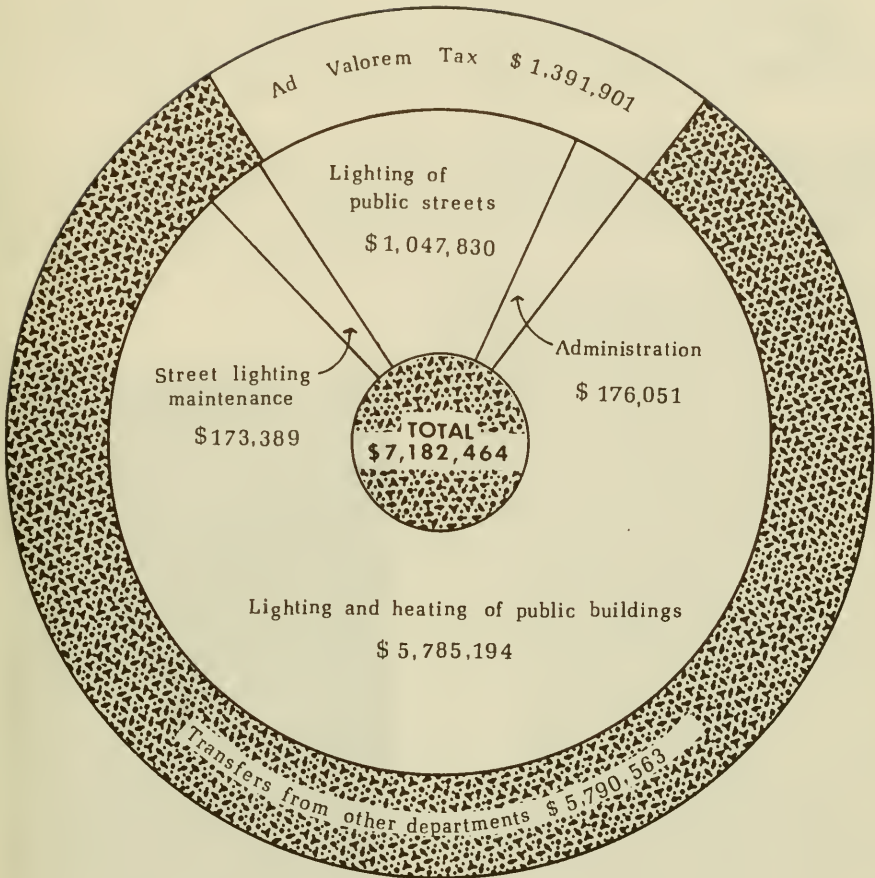
Gross sales of electric energy amounted to \$14,018,953, compared with \$14,662,650 during the fiscal year 1972-73. This decrease in electric revenue reflected the decrease in actual sales during the fiscal year; 1,823,491,146 Kilowatthours as compared with 1,988,623,127 Kilowatthours for fiscal year 1972-73.

Revenue from service orders, rentals, meals and miscellaneous items totaled \$144,734.

Expenditures are summarized on the pie charts following and are detailed in the appendix.



HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1973-74



BUREAU OF LIGHT, HEAT & POWER

REVENUES AND EXPENDITURES

FISCAL YEAR 1973 - 74

POWER SALES

Power and energy delivered to all City departments decreased 5.1% below the previous year, the result of voluntary energy conservation efforts which began in October 1973. The San Francisco International Airport, the single biggest energy consumer of the City departments, contributed significantly to the overall result with an 8.3% reduction, which is a complete turnabout from the comparison between 1972-73 and 1971-72.

Hetch Hetchy power is sold to City departments at cost, representing a saving to taxpayers for 1973-74 of approximately \$3 million, compared to the cost if supplied by local investor-owned utility at the current rates, which are more than 35% higher than those in effect some three years ago.



GENERATOR
HOLM POWERHOUSE

Power and energy delivered to Modesto Irrigation District, Hetch Hetchy's largest power customer, and to Turlock Irrigation District, the third largest, decreased by 8.3% and 28.2% respectively this year. The reason for the Districts' decrease in purchase is two-fold:

- (1) effects of voluntary energy conservation efforts and
- (2) more than normal generation available from their own generating plant because of the increased water storage behind Don Pedro Dam.

The effect of Don Pedro storage on each of the two Districts is different. It has less effect on Modesto's purchase, since Modesto normally generates less than 20% of its total load requirement. Turlock's share of generation normally accounts for 50% or more of its total requirement which is about half of Modesto's.

Gross sales of electric energy amounted to \$14,104,677, compared to \$14,662,650 during 1972-73. This decrease in electric revenue is related to the 4.4% decrease in energy sales to customers resulting from voluntary energy conservation efforts. However, total generation available from Hetch Hetchy powerhouses actually increased 10.7%, as compared to 1972-73, because of the above-normal water conditions in the system's watersheds. The favorable effect of this is noted by the decrease in expenditure for supplementing power and energy from \$2,239,821 to \$447,270.

With energy consumption of existing customers running 4.4% below a year ago, and the prospect that both Hetch Hetchy Reservoir and Lake Lloyd would fill and spill before the annual spring runoff was finished, it was anticipated that a quantity of excess energy would be produced that could be sold by City. Such a sales opportunity was provided by the addition of a new industrial customer load in Sunnyvale known as Lockheed No. 1.

Additionally, under our "banking" arrangement with Pacific Gas and Electric Company, we were able to "bank" 130 million kWhrs for "withdrawal" next year to meet City's loads.



CHU SHUN PENG
Assistant Electrical Engineer

25 —

HUNDRED MILLION KILOWATT-HOURS

SUPPLEMENTAL

20 —

15 —

10 —

5 —

0 —

1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974

(Year Ending June 30)

HETCH HETCHY POWER SYSTEM OUTPUT

MILLIONS OF DOLLARS

15 —

10 —

5 —

0 —

1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974

(Year Ending June 30)

REVENUE FROM SALE OF ELECTRIC ENERGY

WATER PRODUCTION AND TRANSMISSION

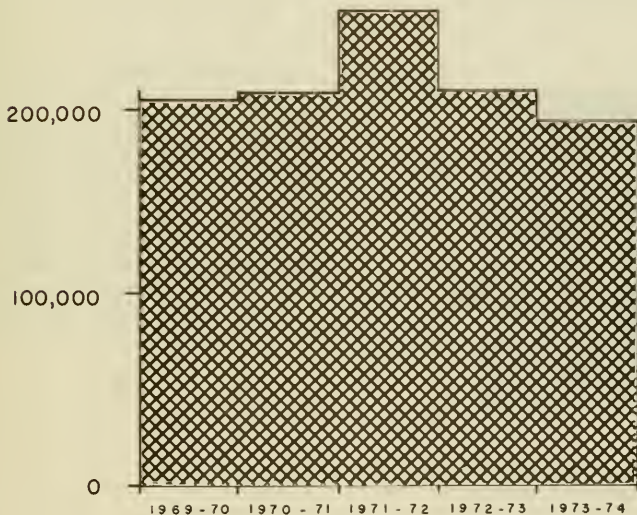
Precipitation recorded for the year at our measuring stations was 112% of the long term average.

During the year, 63,058,000,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 70% of the City's total customer consumption. In addition, 204,391,748 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 22,936,904 gallons were delivered to Groveland Community Service District in Tuolumne County from the Mountain Tunnel.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.

Acre Feet
Delivered
To SFWD

300,000 +



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT

OPERATIONS AND MAINTENANCE - MOCCASIN DIVISION

Transformer Failure Kirkwood Powerhouse

At the City's hydro generating plants, each generator is connected to the high voltage transmission lines through its own bank of transformers. The Phase B transformer for Unit No. 1 at Robert C. Kirkwood Powerhouse failed on January 3, 1974, reducing the total output of the powerhouse by 45%, amounting to approximately \$5,000 per day in lost revenue. In order to reduce this loss to a minimum, it was necessary to obtain, as quickly as possible, the use of a substitute transformer.

Hetch Hetchy was able to obtain a satisfactory substitute from the Pacific Gas and Electric Company. Installation of the substitute transformer was completed on February 21, 1974, restoring the powerhouse to full operation.

With the substitute transformer in service, the damaged transformer was then repaired by performing the work at the powerhouse during normal working hours with Hetch Hetchy's own forces under direct supervision from a factory representative of the transformer manufacturer. The repair is expected to be completed in September 1974.



VELIO KING, Gen. Laborer
JERRY STEWART, Gen. Laborer

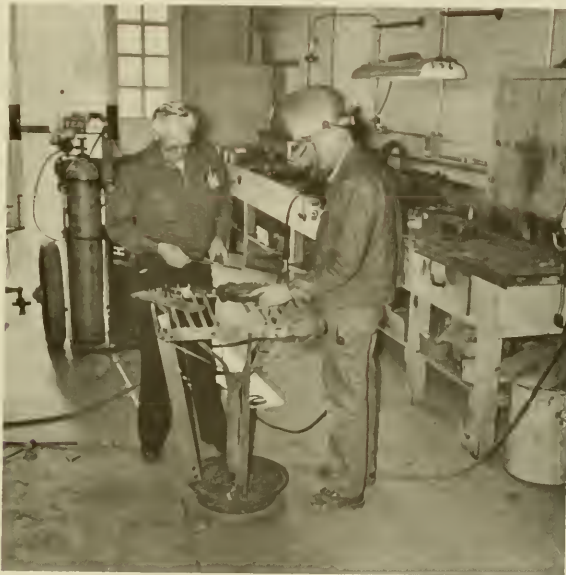


CHARLES COLLINS, Sr. Storekeeper
MARGE WYMER, Clerk

Generator Failure - Holm Powerhouse

An electrical failure occurred in the stator winding of the Unit No. 1 generator at Dion R. Holm Powerhouse on May 18, 1974. The unit was immediately disconnected from the transmission system by protective relays, and investigation of the damage and probable cause was undertaken. Having determined the extent of the damage, repairs were initiated on May 28, 1974, by departmental forces, advised by a representative of the manufacturer.

The work involved the removal of the damaged stator coils from the stator core, repair of the stator core in the area affected by the coil damage, and the installation of seven replacement coils. The repairs were completed and the unit was put back into service on June 28, 1974, about two weeks ahead of schedule.



HAROLD EATON, Shop Supt.
KEN NIX, Welder

OPERATIONS AND MAINTENANCE - TRANSIT POWER DIVISION

The Transit Power Division is responsible for supplying the 600 volt direct current power that is necessary to operate the streetcars and trolley coaches of the San Francisco Municipal Railway.

The Transit Power Division is composed of two sections - the Motive Power Section and the Overhead Lines Section.

Motive Power Section

The Motive Power Section operates and maintains seven substations which convert electric power from 12,000 volts alternating current to 600 volts direct current by means of motor-generators, synchronous converters, and mercury arc rectifiers. The substations operate 24 hours per day, seven days per week, 365 days per year. (See Appendix Table 3 for statistical data.) Motive Power is also responsible for maintaining the electric motors and associated control equipment for operating the cable-winding machinery located in the Cable Car Powerhouse at Washington and Mason Streets.

During the past fiscal year, we have added numerous protective devices to our power conversion equipment to assure a more reliable delivery of power to the Municipal Railway.

Overhead Lines Section

The primary function of the Overhead Lines Section is to maintain, in satisfactory operating condition, the trolley wire overhead facilities and the electric distribution system which conveys power to it. The electric distribution system consists of both overhead lines and underground cables.

Secondary functions include the maintenance of the Municipal Railway Signal Systems and the electric light and power systems of all Municipal Railway buildings.

During the fiscal year 1973-74, the Overhead Lines Section responded to 3,329 emergency calls. In addition to emergency calls, this section has a regular and extensive maintenance program for overhauling all overhead and underground facilities. This section operates with three shifts per day, seven days a week.

ENGINEERING DIVISION

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project and the Transit Power Division. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications.

The Engineering Division is organized into five main sections: Structural and Civil, Electrical, Mechanical, Architectural, and Construction.

During the year, plans and specifications were prepared for the following work to facilitate and maintain Hetch Hetchy operations:

HH-442 - Motorized Valve Operators in San Joaquin Pipelines

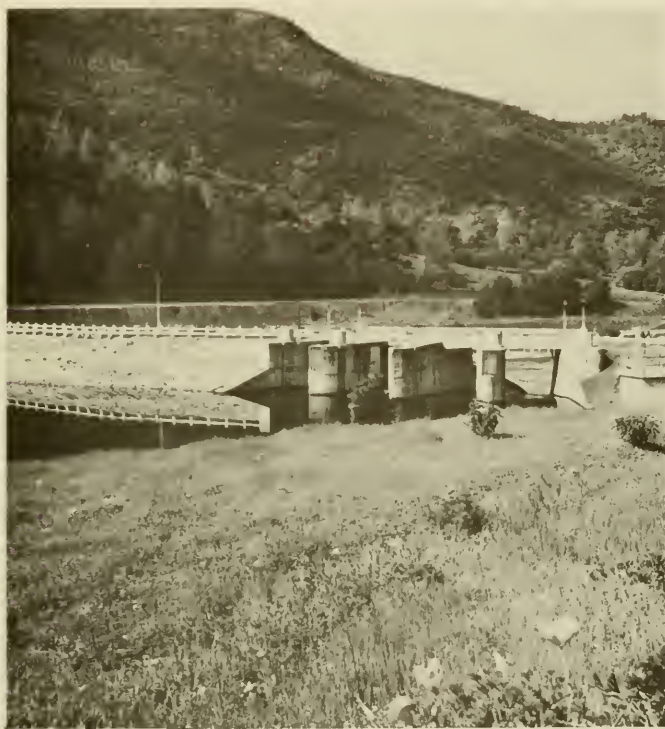
Installation of Motor Operators for San Joaquin Pipeline Valves were completed and tested.



FELICIANO G. SOTTO
Engineering Assistant II
KWANG-TIEN (BOB) HOU
Associate Civil Engineer

HH-443 - Moccasin Dam Spillway - Construct Weir and Energy
Dissipator

Plans and specifications were completed for constructing a weir to raise the level of Moccasin Reservoir nine feet, and to construct an energy dissipator at the foot of Moccasin spillway. By raising the maximum level of Moccasin Reservoir, a greater volume of water can be pushed through the San Joaquin Pipelines and Coast Range Tunnel. The energy dissipator will prevent erosion of the banks of Moccasin Creek when Moccasin Dam spills. Application for approval of design has been filed with the California Division of the Safety of Dams.



MOCCASIN DAM AND SPILLWAY

HH-454 - Moccasin Sewage Treatment Facilities

A package sewage treatment plant producing an odorless effluent and sludge has been planned to replace the existing septic tank system. A Federal "Clean Water Grant" has been applied for that should cover a substantial portion of the cost of construction of the project. Negotiations to acquire land for an effluent sprinkler field, as required by the State Water Quality Control Board, are underway.

HH-461 - Improvement to Domestic Water Supply - Moccasin

New pumps and chlorination system were installed in the new Moccasin Powerhouse. The new installation furnishes water to the storage tanks for domestic use and for fire fighting.

HH-467 - Holm Powerhouse
Penstock Protection

Work under this contract consisted of removing rock slides from the penstock trench; installing rock bolts and reinforced gunite on the cut slopes of the trench to prevent further rock fall, and painting the steel penstock where required.

HH-471 - Replace, Repair
and Paint Steel
Trolley Poles

A contract was let to replace, repair and paint steel trolley poles along Outer Mission Street. This work is part of a program to rehabilitate all steel trolley poles in the City.

HH-475 - San Joaquin Pipelines
Encasement at
Highway 99

A contract was awarded for constructing concrete encasement around the three



ROBERT N. SOTTIMANO
Engineering Assistant II

existing San Joaquin Pipelines located under the proposed State Highway 99 freeway crossings and ramps. The encasement will protect the pipelines from increased loads due to heavy traffic and the high embankment over the pipes. Cost of encasement was borne by the State Department of Transportation.

HH-477 - Moccasin Penstock Valve House

Plans and specifications are being prepared for the construction of a steel frame structure to enclose the butterfly valves at the head of Moccasin penstock. The structure will provide protection and security for the valves.

HH-480 - Moccasin Shops - Paint Room

Contract documents were prepared and request for bids advertised for constructing an additional bay on the south end of the machine shop building at Moccasin for use as a paint spray room. It includes a complete filtered air ventilation system and special lighting. The facility will permit spray painting of equipment to be done indoors.

HH-483 - Exterior Painting and Roof Preservative

Includes painting 23 cottages at Moccasin and application of wooden shingle roof preservative on six cottages at Moccasin and one at Tesla Portal.

HH-486 - Jones Point to Mather Road - Seal Coat

Under this contract, a seal coat was applied to the road from Jones Point to Mather to prolong the life of the road surface.

HH-487 - Moccasin Carpenter Shop - Sawdust Collection System

A contract was let to improve an inadequate sawdust collection system. It is now possible to operate several of the woodworking machines simultaneously and remove dust and chips from the work areas in conformance with safety requirements.

HH-490 - Moccasin Dam Spillway Stilling Basin - Exploratory Core Drilling

Exploratory core drilling was done under this contract to provide dependable data to be used in the final design of the stilling basin and related structures at the end of the present Moccasin Dam Spillway.

HH-495 - Road Repairs -
Highway 120 to
Cherry Dam

Work under this contract consisted of repairing 23 miles of road from State Highway 120 to Cherry Valley Dam. As an aftermath of the fire in the Granite Creek-Cherry Valley area in August 1973, lumber companies, salvaging timber from the burned area, utilized the Cherry Valley access road to a much greater degree than normal, necessitating the repairs. Costs were borne by the logging companies.

HH-499 - Re-roof Cottages
and Garage

Includes re-roofing 12 cottages and one garage at Moccasin.

HH-501 - Repair and Water-
proof Moccasin
Buildings

Includes general repair prior to exterior painting and installation of new siding on five cottages.

San Joaquin Pipeline No. 3

In March, it was necessary to remove and replace a section of 78-inch diameter prestressed concrete pipe which ruptured. In April, the full length of Pipeline No. 3 was inspected. The invert of the concrete pipe and of the cement-lined steel pipe shows some erosion which will require repair. The steel pipe portion with coal tar lining shows no signs of eroding.

Dam Earthquake Failure Study

Inundation maps and calculations were compiled for Priest Dam and Moccasin Dam, and were sent to the Office of Emergency Services (OES). These were prepared on request from OES, in accordance with Senate Bill 896 Seismic Safety.



ANGELITA RODELAS
Senior Clerk Stenographer

TRANSIT POWER IMPROVEMENT PROGRAM

Work during Fiscal Year 1973-74, under the Power Improvement Program, was as follows:

1. Electrification Project

The joint venture firms of PBQ&D, Inc. and Gibbs & Hill, Inc. (PBGH) were selected to provide engineering design services for the installation of trolley wires and feeders in the Market Street Subway, and Twin Peaks and Sunset Tunnels, and modifications to existing streetcar trolley overhead wiring to permit operation of pantograph equipped vehicles.

2. Substation Project

A) Design Services

The firm of Bechtel, Inc. was selected to provide architectural and engineering design services for the construction of substation buildings and installation of rectifier equipment.

Bechtel completed a preliminary report on the first phase of substation design, and began detailed design work on Downtown, Civic Center, Church, Laguna Honda and Fillmore Substations. The 30% completion review documents for these substations were delivered to Hetch Hetchy in June.

Architectural designs prepared by Bechtel for the six new substation sites received Phase I approval from the Art Commission, City and County of San Francisco.

B) Substation Sites

The City Real Estate Department proceeded with acquisition of six new substation sites required for the Power Improvement Program.

A draft Environmental Impact Report, as required under the California Environmental Quality Act of 1970, was prepared by Hetch Hetchy and submitted for evaluation to the City Planning Department for all 14 substation sites required for the Power Improvement Program. After evaluation, the City Planning Department filed a negative Environmental Declaration covering all 14 sites.

Approval of two substation sites, namely Carl and Randolph, is pending before the City Planning Department for conformity to the City Master Plan. The other 12 sites have received approval of conformity to the Master Plan.

C) Equipment Purchase

Technical specifications and bid documents for a purchase contract for the furnishing and delivering of transit power substation equipment required to furnish power for the trolley coaches and new light rail vehicles of the San Francisco Municipal Railway were completed.

Bids for the transit power substation equipment were received by the City's Purchaser on March 29, 1974. The low bid of \$5,896,496 submitted by ITE Imperial Corporation was approved by UMTA and the contract was awarded in June 1974.

3. Control and Communication Project

The firm of Systems Control, Inc. was selected to provide engineering design services for the transit power supervisory control system and for the subway maintenance telephone system.

4. Feeder Undergrounding

A) United Nations Plaza (DPW Contract 23,746)

Plans and specifications for the construction of underground duct lines beneath the United Nations Plaza were completed and transmitted to the Department of Public Works, City and County of San Francisco, for inclusion in their contract for construction of the plaza. The duct lines are for later installation of feeder cables from the new Civic Center substation to the trolley coach lines in the immediate areas.

B) Judah Street (DPW Contract 23,506)

Plans and specifications were prepared for the relocation of trolley poles and the undergrounding of overhead feeder cables on Judah Street, from 4th to 20th Avenues, for inclusion in the City's Department of Public Works' contract for street improvements and track reconstruction. Bids were received on April 10, 1974. The contract, including PIP work in the amount of \$352,017, was awarded to the low bidder, Homer J. Olsen, Inc., San Francisco, California and work on the duct lines started on June 24, 1974.



ROBERT S. RUTHERFORD
Construction Inspector

C) Second and Mission Streets
(HH Contract 489)

Plans and specifications were prepared and bids received for constructing a manhole and concrete encased duct banks in the intersection of Second and Mission Streets. The contract in the amount of \$12,792 was awarded to the low bidder, John H. Thomas and Son, San Francisco, California in May 1974. Work was scheduled to start early in June 1974.

D) Market Street - 7th to 8th
Streets (HH Contract 492)

Plans and specifications were prepared, and bids received, for constructing manholes and concrete-encased duct banks in Market Street between 7th and 8th Streets. Feeder cables from the new Civic Center Station to the Market Street Subway and to trolley coach lines

in the immediate area will be installed in these ducts at a later date. The contract, in the amount of \$145,762 was awarded to the low bidder, Underground Construction Co., Inc., San Leandro, California in April 1974. Construction started in May 1974.

E) 19th Avenue and Municipal Right-of-Way, St. Francis
Circle to Junipero Serra Blvd. (HH Contract 493)

Plans and specifications were prepared and bids received for constructing manholes and underground duct banks in 19th Avenue and in the Muni Railway Right-of-Way between St. Francis Circle and Junipero Serra Blvd. The contract, in the amount of \$168,281.25 was awarded to the low bidder, Underground Construction Co., Inc., San Leandro, California in April 1974. Construction started in May 1974.

- F) Ecker and Stevenson Street Underground Duct System (HH Contract 496)

Plans and specifications for constructing manholes and duct banks in Ecker and Stevenson Streets were completed and were sent to UMTA for approval in June 1974. Feeder cables from the Downtown Substation to the Market Street Subway will be installed in these ducts under a later contract.

- G) Market and Ecker Streets - Construct Manhole (Work Order)

A work order in the amount of \$7,000 to Cahill Construction Company, San Francisco, California, to construct a reinforced concrete manhole structure at Market and Ecker Streets, was approved by UMTA on July 1, 1974. Work will commence early in July 1974.

- H) Fillmore Street - Hayes to Pine Underground Power Facilities (HH Contract 491)

Plans and specifications for the installation of underground power facilities on Fillmore Street between Hayes and Pine Streets were completed in June 1974. Plans and specifications for this contract, which will include the construction of manholes, underground ducts and installation of feeder cables will be sent to UMTA for approval in July 1974.

- I) Junipero Serra Blvd.
Track Reconstruction
and Landscaping
(MR Contract 595R)

Plans and specifications for this joint TIP/PIP project, which include the construction of manholes and underground duct lines for the Power Improvement Program, were transmitted to TIP for inclusion in MR Contract 595R for Junipero Serra Blvd.



JANE CHEE
Senior Clerk Typist

Track Reconstruction and Landscaping. Feeder cables will be installed in these duct lines under HH Contract 517, Junipero Serra Blvd. - St. Francis Circle to Ocean Avenue.



RAYMOND G. MILLER, Construction Engineer
WESLEY J. BRAA, Associate Civil Engineer

- J) Ocean and Phelan Avenues Rechannelization (DPW Contract 23,727)

Work commenced on plans for the relocation of trolley poles and the overhead trolley wire system and the undergrounding of feeder cables which will be included, along with Muni Railway streetcar track relocation and rerailing in a Department of Public Works contract for Ocean and Phelan Avenue rechannelization.

- K) Ocean Avenue - Junipero Serra Blvd. to Phelan Avenue (HH Contract 502)

Work commenced on the preparation of plans and specifications for constructing manholes and underground duct banks in Ocean Avenue between Junipero Serra Blvd. and Phelan Avenue. Feeder cables will be installed in these duct banks under a later contract.

- L) "M" Line - Junipero Serra Blvd. to Plymouth Street (HH Contract 519)

Work commenced on the preparation of plans and specifications for constructing manholes and underground duct banks in 19th Avenue, Randolph Street, Orizaba Avenue and Broad Street between Junipero Serra Blvd. and Plymouth Street. The duct lines are for the later installation of feeder cables.

M) Manhole Frames and Covers

Specification and bid documents were prepared for a contract for the purchase of approximately 100 sets of manhole frames and covers to be used for duct line contracts.

Bids were received in January 1974. The contract in the amount of \$25,810 was awarded to Phoenix Iron Works on March 21, 1974.

N) Other Work

Preliminary engineering and plans and specifications are proceeding for duct lines and feeder undergrounding in accordance with the requirements of the Program. Work commenced on the preparation of technical specifications and bid documents for a purchase contract for insulated copper feeder cable. This cable will be installed under later contracts in duct lines now under construction and duct lines to be constructed.

5. Overhead Line Work

A) Installation of San Jose Avenue Storage Track Trolley System (HH Contract 488)

Plans and specifications were completed and bids were received for a contract for construction of streetcar overhead wiring for the new temporary storage track at the Ocean Avenue Yard constructed under Contract MR-604 of the Transit Improvement Program. The contract for HH Contract 488, which is funded under TIP Grant CA-03-0043 was awarded to the low bidder, L. K. Comstock & Company, Inc., San Francisco, California in the amount of \$10,800. Construction work was completed in February 1974.

B) Junipero Serra Blvd. - St. Francis Circle to Ocean Avenue (HH Contract 517)

Work commenced on preparation of plans and specifications for trolley pole replacement and overhead trolley wire installation on Junipero Serra Blvd. from St. Francis Circle to Ocean Avenue. Under this contract, which will include street lighting work and will immediately follow the track reconstruction and landscaping contract, MR 595R, feeder cables will be installed in the duct lines constructed in MR 595R; connections to trolley wire will be made, new trolley poles will be installed, and the existing overhead facilities will be disconnected and removed.

C) Trolley Wire - Purchase Contract

Work commenced on preparation of technical specifications and bid documents for the purchase of bronze trolley wire to be used in future overhead modification contracts.

D) Other Work

Preliminary engineering and plans and specifications are proceeding for overhead modification contracts in accordance with the requirements of the program:

6. Miscellaneous

- A) Coordination meetings of the joint staffs of Muni Railway, Transit Improvement Program and the Hetch Hetchy Power Improvement Program were held monthly.

BUREAU OF LIGHT HEAT AND POWER



ARMY STREET CIRCLE

STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities which are 42.1% owned by the City; 56.0% owned by the Pacific Gas and Electric Company, and 1.9% jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 86.5% of the lights are City-owned. Five years ago the corresponding figure was 75.5%.

In fiscal 1933-34, the cost for street lighting was \$1.25 per capita; last year, with approximately thirty times as much light on the streets and public thoroughfares, the cost per capita was approximately \$1.83.

Maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Bureau. A second contract covered work required for repair of damaged and defective equipment, painting and miscellaneous maintenance.

Under contract, the Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes and emergency work required during other than normal working hours. Electric energy for all City and Company-owned street lighting operation was supplied by the Hetch Hetchy power system.

Engineering

The Bureau reviews, recommends changes, approvals or rejections of, and correlates all street lighting installations, including that done by the Department of Public Works, the Pacific Gas and Electric Company, the Bay Area Rapid Transit District, the State of California, subdividers, etc.

During the fiscal year 1973-74, 16 street lighting contracts, involving a total of 506 new street lights, were approved by the Public Utilities Commission. Plans were submitted for approval only after careful checking to determine that illumination will exceed the minimum requirements established by the American National Standards Institute; and that all materials used, and manner of installation, meet with the applicable local, state and federal rules, regulations and statutes governing the installation of electrical work.



RICHARD L. BIGNARDI
Electrical Engineering Assistant II



MARKET STREET
PATH OF GOLD



ROBERT S. KWONG
Electrical Engineering Assistant II
NELVIN JOHNSON
Account Clerk

Operation and Maintenance

As of June 30, 1974, a total of 36,991 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, over crossings, tunnels and underpasses. A summary of the number and types of units in service at the end of the fiscal year is shown in Appendix Table 14.

A total of \$1,269,225 was expended for operation, maintenance and repair of the street lighting system. Of the total cost, \$12,197 was paid by the State for its share of the operation and maintenance of street lighting at intersections on City streets, which are part of the State highway system.

During the fiscal year, there were 145 accidents involving damage to City-owned street lighting property. Investigation was made, as soon as possible, to remove hazards to the public, and obstructions to traffic. Total cost of repairs to damaged City-owned street lighting property was \$74,582. Every effort was made to secure reimbursement for damages incurred from responsible parties. Previous experience indicates that approximately three-fourths of the repair costs will be recovered.

Complaints

During the year, 80 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and requests for temporary and permanent relocation of street lighting poles.

Improvements

During the fiscal year 1973-74, a total of 450 new City-owned street lights were placed in service at a cost of \$550,000. Improvements were financed by State Gasoline Tax and the 1972 Street Lighting Bond Issue, as indicated in Appendix Tables 16 and 17.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system, and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments are furnished by the Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year 479,717,297 kilowatthours of electrical energy were consumed through 979 municipal accounts at an expenditure of \$4,920,136. Of the above, 158,017,411 kilowatthours of energy were supplied to the San Francisco International Airport for resale to tenants. Natural gas consumption was 17,882,381 therms through 550 accounts at a cost of \$1,339,486. One account consumed 1,501,784 pounds of steam at a cost of \$3,087.

There were four increases in gas rates last year which increased the cost to municipal accounts by approximately \$81,175.

A summary of consumption and expenditures for these commodities is shown in Tables 12 and 13.

Energy Conservation

As stated above, electrical consumption during the second half of the fiscal year was down, as compared to the same period for the previous year. This was the result of the efforts of the Mayor's Energy Conservation Committee and the resultant cooperation of City employees in general. Normally, an increase of 8.6 percent per year can be expected.

Gas consumption decreased by 7.8 percent during the last six months of the fiscal year when a 3.5 percent increase would normally be expected.

A P P E N D I X

TABLE 1

HETCH HETCHY WATER AND POWERCOMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)FISCAL YEAR 1973-74

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 688,149	\$ 626,232	\$ -61,917
111	Overtime	13,520	11,497	- 2,023
112	Holiday Pay	5,427	4,027	- 1,400
113	Extended Work Week	2,796	1,740	- 1,056
120	Temporary Salaries	47,840	41,753	- 6,087
130	Wages	1,261,320	1,236,513	-24,807
139	Wages - Gardeners	44,018	41,691	- 2,327
200	Contractual Service	100,895	101,468	573
216	Maint. and Repair of Auto Equipment	14,000	12,552	- 1,448
231-1	Purchase of Power for Resale	600,000	406,615	-193,385
232-2	Service Charge for Transm. and Dist.	2,355,200	2,205,701	-149,499
251	Subsistence of Employees	9,500	1,724	- 7,776
300	Materials and Supplies	135,810	168,964	33,154
640	Water Rights and Damage Claims	12,000	12,000	-0-
641	Hydrography	37,000	36,255	- 745
801	Accident Compensation	16,500	17,490	990
804	Claims	500	-0-	- 500
812	Fidelity Insurance	72	72	-0-
813	Automobile Insurance	6,075	8,043	1,968
814	Fire Insurance	10,382	7,184	- 3,198
815	Miscellaneous Insurance	12,241	12,241	-0-
853	Assessments Paid to Other Districts	66,100	19,214	- 46,886
854	Membership Dues	4,014	4,283	269
855	Fees to U.S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads and Trails - Raker Act	15,000	13,196	- 1,804
860	Retirement Allowance	331,200	293,523	- 37,677
862	Social Security	101,500	87,105	- 14,395
865	Health Service System	20,297	19,419	- 878
870	Taxes	470,743	470,743	-0-
880	Rental - Transmission Lines and Offices	114,000	114,000	-0-
900	Services of Other Departments	783,796	783,796	-0-
	TOTAL OPERATION AND MAINTENANCE	\$ 7,309,895	\$ 6,789,041	-520,854
400	Equipment	34,897	34,166	- 731
500	Additions and Betterments	119,600	119,600	-0-
700	Reconstruction and Replacement	215,400	215,400	-0-
800	Bond Interest and Redemption	9,321,139	9,319,995	- 1,144
	TOTALS	\$17,000,931	\$16,478,202	\$ -522,729

TABLE 2
HETCH HETCHY WATER AND POWER

TAXES

FISCAL YEAR 1973-74

<u>Tax Levying Bodies</u>	<u>Assessed Value</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 1,975.00	\$ 214.58
San Joaquin County	37,875.00	4,219.02
San Mateo County	3,240.00	332.48
Stanislaus County	103,850.00	9,529.42
Tuolumne County	5,100,245.00	455,097.84
Banta-Carbona Irrigation District	3,233.80	139.05
Oakdale Irrigation	24,640.00	1,108.80
West Stanislaus Irrigation District	<u>1,700.00</u>	<u>102.00</u>
	\$5,276,758.80	\$470,743.19

TABLE 3

TRANSIT POWER DIVISION

MOTIVE POWER SECTION - SUBSTATIONS

Substation	Type (a)	Date Installed	No. of Units	KW Size	Fiscal Year 1973-74	
					Max. Load in KW	KWH Converted to 600 V d-c
Bryant	M-G M-G	1910 1910	3 (b) 2	1500 1500	2660	7,759,200
Turk	M-G M-G	1910 1910	3 (b) 2	1500 1500	3866	9,057,000
Downtown	SC SC	1921 1924	2 1	2000 3000	3516	8,266,800
Eighth Avenue	SC SC SC	(c) 1921 (c) 1921 1924	1 (b) 1 1	1500 1500 2000	1472	4,170,500
West Portal	MAR	1951	1	2000	2288	6,062,000
Outer Mission	MAR	1953	1	750	935	2,667,000
Geneva	M-G	1910	3	1500	1880	<u>167,900</u> 28,150,400

Notes: (a) Type of Conversion Equipment:
M-G = Motor - Generator
SC = Synchronous Converter
MAR = Mercury Arc Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Nason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES

FISCAL YEAR 1973-74

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>UNDER, OVER</u>
110-1	Permanent Salaries	\$ 67,829	\$ 57,770	- 10,059
130-1	Wages	1,023,758	897,376	- 126,382
300-1	Materials and Supplies	50,050	34,111	- 15,939
801-1	Accident Compensation	23,500	12,650	- 10,850
860-1	Retirement Allowances	143,229	126,937	- 16,292
862-1	Social Security	36,540	38,226	- 1,686
865-1	Health Service System	7,307	8,498	- 1,191
900-1	Services of other Departments	<u>151,766</u>	<u>151,766</u>	<u>-0-</u>
	TOTAL OPERATION AND MAINT.	\$1,503,979	\$1,327,334	- 176,645
400	Equipment	3,815	3,815	-0-
500-1	Additions and Betterments	11,900	11,900	-0-
700-1	Reconstruction and Replacements	<u>3,000,000</u>	<u>3,000,000</u>	<u>-0-</u>
	TOTAL	<u>\$4,519,694</u>	<u>\$4,343,049</u>	<u>- 176,645</u>

TABLE 5
HETCH HETCHY WATER AND POWER
SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1973-74

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
Revenue from Sale of Electrical Energy	\$ 13,900,000	\$ 14,104,677	\$ 204,677
Revenue from Sale of Water and Standby Charge, SFWD	6,000,000	6,000,000	-0-
Other Revenue	<u>80,000</u>	<u>145,371</u>	<u>65,371</u>
	\$ 19,980,000	\$ 20,250,048	\$ 270,048
 <u>EXPENDITURES</u>			
Total Expenditures	\$ 21,520,625	\$ 20,821,251	\$ -699,374
	<u><u> </u></u>	<u><u> </u></u>	<u><u> </u></u>

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

<u>SEASON PRECIPITATION (INCHES)</u>	<u>Normal</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74</u>
Hetch Hetchy	34.18	35.07	29.95	24.84	35.97	38.46
Lake Lloyd	46.87	51.95	41.94	32.77	46.03	52.45
Approx. Percent of Normal	100%	108%	89%	71%	102%	112%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	731,553	889,700	681,600	584,400	780,798	870,104
Lake Lloyd)	414,136	518,400	409,100	331,800	447,358	525,904
Lake Eleanor)						
Total	1,153,623	1,408,100	1,090,700	916,200	1,228,157	1,396,008
Approx. Percent of Normal		122%	95%	79%	106%	127%
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>	<u>No-Spill</u>					
Capacity						
Hetch Hetchy	360,360	357,208	356,617	324,530	362,736	360,163
Lake Lloyd	268,800	243,854	199,983	151,653	217,872	268,284
Lake Eleanor	27,100	27,016	27,403	2,110	27,016	26,726
Total	656,260	628,078	584,003	478,293	607,624	655,173
<u>DELIVERY TO SFWD (ACRE-FT.) (a) (b)</u>						
Average per day		565	578	702	585	532
Maximum per day		856	748	856	850	850
Total for fiscal year		206,514	210,992	257,046	213,684	193,518

Total since operation of Hetch Hetchy Aqueduct began in 1934.

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
(b) Includes delivery to Livermore site, U. S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1973-74

<u>PLANT DATA</u>	<u>Nameplate Rating (Kilowatts)</u>	<u>Capability (Kilowatts)</u>	<u>Annual Plant Factor - %</u>
Moccasin Powerhouse	90,000	104,000	61.0
Dion R. Holm Powerhouse	135,000	150,000	62.4
Robert C. Kirkwood Powerhouse	67,500	85,000	82.9
Total	292,500	339,000	
<u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse		555,300,000	
Dion R. Holm Powerhouse		819,993,000	
Robert C. Kirkwood Powerhouse		617,557,000	1,992,850,000
<u>Station Service</u>			
Moccasin Powerhouse		881,400	
Dion R. Holm Powerhouse		1,125,710	
Robert C. Kirkwood Powerhouse		768,600	2,775,710
<u>Net Generation</u>			1,990,074,290
<u>Supplementary Energy</u>			
"Bank" Withdrawal*		36,435,281	
Purchase (PG&E Co.)		44,401,773	80,837,054
<u>Total</u>			<u>2,070,911,344</u>
<u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts		482,482,697	
Modesto Irrigation District		787,392,000	
Turlock Irrigation District		302,784,000	
Kaiser Cement and Gypsum Corporation		156,720,000	
Kaiser Aluminum and Chemical Corporation		31,320,000	
Norris Industries, Inc.		22,502,016	
Lockheed Missiles and Space Company, Inc.		39,556,800	
Miscellaneous Customers		733,633	1,823,491,146
<u>Non-Revenue</u>			
Project Use		3,266,691	
"Bank" Deposit*		130,908,552	134,175,243
<u>Losses</u>			
Hetch Hetchy System		37,706,350	
PG&E System (Municipal and Industrial Accounts)		75,538,605	113,244,955
<u>Total</u>			<u>2,070,911,344</u>

*In accordance with letter-agreement between City and PG&E Co. dated April 10, 1973.

TABLE 8

HETCH HETCHY POWER SYSTEMCOMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERSFISCAL YEARS 1972-73 AND 1973-74

(Nearest 100,000 Kilowatthours)

<u>CUSTOMER</u>	<u>1972-73</u>	<u>1973-74</u>
Municipal Accounts		
International Airport	216,800,000	198,700,000
Municipal Railway	61,700,000	63,600,000
Public Works	26,400,000	26,000,000
Street Lighting	45,400,000	45,500,000
Unified School District	38,400,000	37,800,000
Water Department	44,400,000	40,400,000
Other City Departments	75,200,000	70,500,000
Modesto Irrigation District	858,800,000	787,400,000
Turlock Irrigation District	421,500,000	302,800,000
Kaiser Cement and Gypsum Corp.	145,400,000	156,700,000
Kaiser Aluminum and Chemical Corp.	31,500,000	31,300,000
Norris Industries, Inc.	22,300,000	22,500,000
Lockheed Missile & Space Co., Inc.	-	39,600,000
Miscellaneous Customers	<u>800,000</u>	<u>700,000</u>
 TOTAL	 <u><u>1,988,600,000</u></u>	 <u><u>1,823,500,000</u></u>

TABLE 9

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1972-73 AND 1973-74
 (Nearest \$1,000)

<u>CUSTOMER</u>	<u>1972-73</u>	<u>1973-74</u>
Municipal Accounts		
International Airport	\$ 1,781,000	\$ 1,666,000
Municipal Railway	623,000	640,000
Public Works	319,000	321,000
Street Lighting	480,000	481,000
Unified School District	572,000	560,000
Water Department	402,000	376,000
Other City Departments	933,000	902,000
Modesto Irrigation District	5,069,000	4,510,000
Turlock Irrigation District	2,601,000	1,696,000
Kaiser Cement and Gypsum Corp.	1,348,000	1,773,000
Kaiser Aluminum and Chemical Corp.	305,000	377,000
Norris Industries, Inc.	220,000	225,000
Lockheed Missile & Space Co., Inc.	-	483,000
Miscellaneous Customers	<u>9,000</u>	<u>9,000</u>
 TOTAL	 \$14,662,000	 \$14,019,000

TABLE 10

HETCH HETCHY POWER SYSTEM
ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74</u>
NET GENERATION						
Moccasin Powerhouse	465,854,212	493,702,900	531,070,800	533,978,200	542,886,200	554,418,600
Dion R. Holm Powerhouse	944,664,850	887,037,320	892,230,400	808,515,430	653,141,570	818,867,290
Robert C. Kirkwood Powerhouse	598,681,120	615,542,120	630,874,100	614,151,930	601,147,890	616,788,400
Subtotal	2,009,200,182	1,996,282,340	2,054,175,300	1,956,645,560	1,797,175,660	1,990,074,290
SUPPLEMENTAL ENERGY						
"Bank" Withdrawal**	81,906,642	191,365,500	133,964,745	46,360,466	-0	36,435,281
Purchase (PG&E Co.)	40,798,879	0	46,097,953	108,734,434	351,288,448	44,401,773
Subtotal	122,705,521	191,365,500	180,062,698	155,094,900	351,288,448	80,837,054
TOTAL	<u>2,131,905,703</u>	<u>2,187,647,840</u>	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>	<u>2,070,911,344</u>
DISTRIBUTION						
Sales						
Municipal Accounts	412,201,831	427,168,499	458,127,155	478,105,789	508,259,909	482,482,697
Modesto Irrigation Dist.	597,864,000	637,972,000	728,371,000	796,740,000	858,816,000	787,392,000
Turlock Irrigation Dist.	263,616,000	271,156,800	321,456,000	360,619,200	421,484,000	302,784,000
Kaiser Cement & Gypsum	173,061,180	168,705,080	152,736,000	152,127,205	145,368,000	156,720,000
Kaiser Aluminum & Chemical	30,744,000	39,240,000	39,549,000	33,996,000	31,521,600	31,320,000
Norris Industries, Inc.	35,914,140	35,721,216	24,033,485	17,664,768	22,325,760	22,502,016
Dow Chemical Company	23,582,132	---	---	---	---	---
Hercules, Inc.	97,776,000	92,844,000	94,662,000	57,906,000	---	---
California Ammonia Co.	101,720,736	103,020,000	104,280,480	80,876,760	---	---
Air Products & Chemicals	32,930,496	34,617,984	32,653,056	---	---	---
Valley Nitrogen Producers	28,675,920	124,884,480	108,631,560	---	---	---
Lockheed Missile	---	---	---	---	---	---
Miscellaneous Customers	1,016,562	664,093	745,614	759,065	847,858	39,556,800
						733,633
Non-Revenue						
Project Use	3,787,748	3,744,004	4,101,136	4,287,512	4,003,796	3,266,691
"Bank Deposit"*	205,895,527	135,151,010	47,826,652	9,756,928	28,985,698	130,908,552
Losses	102,119,431	112,758,674	117,064,260	118,901,233	126,851,487	113,244,955
TOTAL	<u>2,131,905,703</u>	<u>2,187,647,840</u>	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>	<u>2,070,911,344</u>

*In accordance with letter - agreement between City and PG&E Co. dated April 10, 1973.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1973-74

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER +OVER</u>
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 159,546	\$ 136,584	- 22,962
111	Allowance for Overtime	525	506	- 19
112	Holiday Pay	362	202	- 160
200	Contractual Services	1,125	754	- 371
231	Lighting and Heating of			
	Public Buildings - General	1,368,425	1,276,954	- 91,471
231-1	Lighting and Heating of			
	Public Bldgs. - Special Fund	4,925,495	4,508,240	-417,255
231-2	Lighting of Public Streets -			
	Pacific Gas and Electric Co.	580,000	577,467	- 2,533
231-3	Lighting of Public Streets -			
	Hetch Hetchy	477,000	469,163	- 7,837
231-4	Lighting of Public Streets -			
	Calif. Division of Highways	1,200	1,200	-0-
300	Materials and Supplies	425	376	- 49
400	Equipment	500	498	- 2
813	Auto Insurance	450	257	- 193
860	Retirement Allowance	19,688	18,455	- 1,233
862	Social Security	6,585	4,250	- 2,335
865	Health Service System	2,720	2,169	- 551
954	EDP - PUC Data Processing	12,000	12,000	-0-
	TOTAL	<u>\$ 7,556,046</u>	<u>\$ 7,009,075</u>	<u>-546,971</u>

RECEIPTS

	Interfund Receipts*	\$ 6,024,176	\$ 5,617,174	-407,002
	Ad Valorem Taxes	<u>1,531,870</u>	<u>1,391,901</u>	<u>-139,969</u>
		<u>\$ 7,556,046</u>	<u>\$ 7,009,075</u>	<u>-546,971</u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

<u>DESCRIPTION</u>	<u>TOTAL FUNDS</u>	<u>EXPENDITURE</u>	<u>-UNDER +OVER</u>
Maintenance and Repair of			
Street Lighting Installations	\$ 174,200	\$ 173,389	- 811

*Transfers from other departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1973-1974

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION KILOWATT-HOURS</u>	<u>EXPENDITURES</u>
Adult Probation	1	13,598	342
Art Museum	1	991,360	11,346
Auditorium and Brooks Hall	1	4,334,600	47,363
Child Care Centers	11	242,010	5,560
City Planning	1	72,940	1,507
De Young Museum	1	2,899,200	28,593
Disaster Corp.	1	7,459	1,998
Electricity	6	420,341	7,461
Farmer's Market	1	23,040	547
Fire (a)	61	2,878,946	59,423
Hassler Health Home	1	199,800	3,119
Health	33	14,548,323	142,709
Hetch Hetchy	6	131,928	3,578
Hidden Valley Ranch	1	952,800	10,969
International Airport (b)	8	198,724,027	1,666,442
Junior College District	14	7,375,005	78,812
Legion of Honor	1	464,800	6,300
Library	31	2,707,717	45,225
Log Cabin Ranch	13	386,067	10,796
Municipal Railway	39	63,609,150	640,201
Parking Authority	18	156,712	3,858
Police	17	883,240	17,884
Public Building	9	15,716,294	139,026
Public Works	82	25,629,891	315,626
Purchasing	5	491,020	7,485
Real Estate	1	169,280	2,554
Recreation and Park	206	10,262,058	179,177
Recreation and Park - Candlestick Park	2	2,100,160	47,229
Recreation and Park - Yacht Harbor	33	1,308,140	28,078
Sheriff	3	1,589,440	16,027
Social Services	7	1,131,209	15,827
Street Lighting Operations (.003)	1	45,513,192	469,163
Unified School District	229	30,457,054	481,238
War Memorial	1	1,276,640	16,169
Water	126	40,332,708	375,507
Youth Guidance	3	1,403,551	14,600
TOTAL MUNICIPAL DEPARTMENTS	975	479,403,700	4,901,739
Academy of Sciences	2	2,765,400	26,220
State of California: Street Lighting	1	(c)	12,197
Traffic Devices	1	313,597	6,200
TOTAL FROM HETCH HETCHY	979	482,482,697	4,946,356
Fire Department, For Resale to Fort Mason	1	686,102	10,047
GRAND TOTAL	980	483,168,799	4,956,403

Notes: (a) Electricity purchased for resale to Fort Mason excluded.

(b) Includes 158,017,411 KWH resold at Commercial rates for 1,378,555 Airport tenants.

(c) Included under Street Lighting Operations.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1973-1974

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURE</u>
Adult Probation	1	1,130	113
Auditorium and Brooks Hall	2	854	104
Child Care Centers	10	28,308	2,548
City Planning	1	4,558	399
De Young Museum	1	285,244	23,373
Disaster Corp.	1	398	44
Electricity	2	47,673	3,951
Farmer's Market	1	671	73
Fire	58	697,070	57,250
Hassler Health Home	3	31,459	2,660
Health	30	4,896,271	307,932
Hetch Hetchy	2	1,324	165
International Airport	6	1,568,714	106,512
Junior College District	9	842,358	67,082
Legion of Honor	1	60,614	5,014
Library	28	106,252	9,265
Municipal Railway	11	328,584	30,049
Police	10	48,791	4,273
Public Buildings	5	1,373,045	96,485
Public Works	15	273,883	26,600
Purchasing	3	60,870	4,993
Recreation and Park	103	1,213,125	101,078
Recreation and Park - Candlestick Park	1	113,525	9,331
Registrar of Voters	1	8,072	696
Sheriff	2	446,591	36,916
Single Men's Rehabilitation Center	1	31,409	2,616
Social Services	4	72,105	6,008
Unified School District	219	4,482,678	365,288
War Memorial	3	241,279	19,915
Water	12	156,292	13,235
Youth Guidance	4	459,234	35,518
TOTAL MUNICIPAL DEPARTMENTS	550	17,882,381	1,339,486

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURE</u>
Social Services	1	1,501,784	3,087

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1974

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY- OWNED</u>	<u>JOINTLY- OWNED</u>	<u>CITY- OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500 " "	252	24	73	349
4,000 " "	1,051	129	1,569	2,749
6,000 " "	579	457	3,070	4,106
10,000 " "	439	21	546	1,006
23,000 " Fluorescent	---	---	---	---
400-Watt Mercury Vapor	5	43	170	218
1,000 " "	---	---	3	3
175-Watt Mercury Vapor	---	---	10	10
250 " "	2	---	---	2
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	107	107
2,500 " "	12	4	58	74
4,000 " "	187	2	104	293
6,000 " "	32	5	85	122
10,000 " "	10	---	13	23
5,500 " Fluorescent	---	---	38	38
23,000 " "	39	---	5	44
100-Watt Mercury Vapor	---	---	112	112
175 " "	43	---	3,323	3,366
250 " "	37	---	979	1,016
400 " "	303	---	4,701	5,004
700 " "	---	---	365	365
1,000 " "	---	---	137	137
400 " Lucalox	---	---	21	21
448 " Incandescent	---	---	15	15
<u>OVERHEAD CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	1	---	---	1
4,000 " "	28	---	42	70
6,000 " "	---	---	---	---
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	9	---	---	9
4,000 " "	52	---	11	63
6,000 " "	8	---	1	9
175-Watt Mercury Vapor	14,756	---	1	14,757
250 " "	1,956	---	---	1,956
400 " "	924	---	---	924
TOTAL, JUNE 30, 1974	20,725	707	15,559	36,991
	56.0%	1.9%	42.1%	100%
TOTAL, JUNE 30, 1973	20,876	707	15,229	36,812
NET CHANGE DURING THE YEAR	-151	-0	+330	+179

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1973-74

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	809,288		
Jointly-owned facilities (a)	35,165		
City-owned facilities (b)	149,531	993,984	
Less deduction for energy component		416,531	577,453
Emergency service to City-owned facilities			3,821

Lease-Lite Corporation

Group lamp replacement - City-owned facilities			46,819
--	--	--	--------

MAHONEY ELECTRIC

Maintenance and repair - City-owned facilities			
Routine maintenance		39,487	
Repair of damage caused by accidents (c)		38,684	
Repair of damage caused by equipment failure		27,890	
Repair of damage caused by vandals		2,248	108,309

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	25,604		
Damage caused by equipment failure	7,889		
Damage caused by vandals	951		34,444

ELECTRIC ENERGY (HETCH HETCHY)

45,545,717 kWh @ \$0.01345 less 21% discount			483,946
--	--	--	---------

TOTAL EXPENDITURE 1,254,792

LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway routes	12,197		
Recreation and Park Dept. for off-street lighting	2,236		14,433

TOTAL NET EXPENDITURE 1,269,225

AVERAGE OPERATING COST

Based on number of lights in service June 30, 1974, average total cost of operation, maintenance and repair per light per year:			<u>34.31</u>
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- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16
BUREAU OF LIGHT, HEAT AND POWER
NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1973-74

<u>Locations</u>	<u>Number of Lights</u>	<u>Type of Lights *</u>	<u>Value</u>
Financed by Bond Issues:			
25th Avenue - Fulton to Scenic Drive	63	M	\$70.066
Anzavista Area	74	M	52.060
Potrero Area	53	M	62.724
Apparel City Area	<u>77</u>	M	<u>51.464</u>
TOTALS	267		236.314
Financed by State Gasoline Tax:			
Marina District - Part II Stage 2	39	M	63.925
California and Spruce Streets	4	M	4.800
South of Market - Contract 4	31	M	37.128
Golden Gate Heights - Contract 3	10	M	10.822
Bay Street - Jones to Taylor	4	M	8.326
Market Street Reconstruction - Contract 2A	12	L	38.428
Clay Street - Montgomery to Leidesdorff	4	M	6.854
La Salle Street - Mendell to Lane	4	M	7.136
Mendell Street - La Salle to Innes	12	M	15.197
Market Street - Ord to Burnett	-	-	5.825
Esmeralda Stairway	2	M	6.040
Harney Way Widening	9	M	10.814
Noe and Sanchez Streets	6	M	27.955
24th Street - Third to Tennessee	2	M	4.758
Digby and Everson Streets	-	M	5.014
Jennings Street - Evans to Arthur	<u>10</u>	M	<u>13.742</u>
TOTALS	149		266.764
GRAND TOTALS	416		503.078

* M = Mercury Vapor

* L = Lucalox

TABLE 17
BUREAU OF LIGHT, HEAT AND POWER
HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to							
July 1, 1953	\$ 1,748,675	\$ 617,115	-	\$576,404	\$ 22,650	\$ 477,651	\$ 3,442,495
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	155,727	30,817	-	748	16,578	543	204,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	538	182,762
1959-60	-	100,126	-	35,874	10,242	4,083	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	474,673	\$ 522,899	-	-	-	997,572
1966-67	-	111,164	188,312	5,000	-	-	304,476
1967-68	-	175,949	331,941	-	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	-	1,031,201
1969-70	-	359,635	261,000	-	-	-	620,635
1970-71	-	490,031	1,550,442	-	-	-	2,040,473
1971-72	-	541,534	1,810,011	-	-	-	2,351,545
1972-73	-	415,614	-	-	-	-	415,614
1973-74	-	266,764	236,314	-	-	-	503,078
Totals	\$ 2,178,926	\$5,095,871	\$5,517,641	\$878,534	\$197,350	\$ 498,275	\$ 14,366,597
Less: Cost of portions removed prior to fiscal year 1972-73						\$ 1,538,373	
Cost of portions removed during fiscal year 1973-74						108,300	
							\$ 1,646,673
Original cost of City-owned facilities in service on June 30, 1974							\$ 12,719,924

* Includes WPA and PWA (1933-42). Boulevard Construction (1932-34), Municipal Railway, Recreation and Park Department and Housing Authority.

TABLE 18

HETCH HETCHY WATER AND POWERCONSTRUCTION CONTRACTS
FISCAL YEAR 1973-74

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time</u>		<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
			<u>Started</u>	<u>Completed</u>		
HH-442	Motorize Valves - San Joaquin Pipe Lines, Oakdale Portal & Tesla Portal Valve Houses	OBCO Contractors & Engineers	6- 1-71	(5-3-73) 6-23-74	28,280	4,448
HH-467	Repair Slides and Construct Slope Protection on Holm Penstock Trench Slopes	National Bridge Co.	8-20-73	12- 6-73	145,855	164,941
HH-470	Replacement of the Existing d-c Switchboard at O'Shaughnessy Dam	Slater Electric Co. of California	8-20-73	12-26-73	4,320	4,320
HH-471	Replace, Repair and Paint Trolley Poles on Mission Street	Abbett Electric Corp.	1- 7-74	-	30,021	15,375
HH-472	Construct Reinforced Concrete Floor at South Fork Maintenance Yard	George Reed, Inc.	6-11-73	7- 9-73	6,920	6,920
HH-473R	Install Standby Pump at Kirkwood Powerhouse	Brown Street Metal & Mechanical Inc.	7-16-73	9-14-73	5,800	5,800
HH-475	Construct Encasement to Protect San Joaquin Pipelines at the New Highway 99 Crossing	Chas.I. Cunningham Co.	11- 5-73	3-29-74	181,111	179,597
HH-476	Relocate Transmission Towers in the Path of Proposed Highway 99	Slater Electric Co. of California, Inc.	10-15-73	12-10-74	37,800	37,800
HH-478	Insulate Metal Buildings at Moccasin and Red Mountain Bar	Valley Asbestos Co.	1-21-74	3- 5-74	3,023	3,023
HH-481	Moccasin Houses - Ceiling Insulation	Sacramento Insulation Contractor	3- 4-74	5- 2-74	6,230	5,973

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1973-74

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Started</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-485C	Moccasin-Newark Transmission Line - Paint Steel Tower	C. C. Knight Painting	9-17-73	11-15-73	31,755	31,755
HH-486	Seal Coat - Jones Point to Mather Road	George Reed, Inc.	5-13-74	6-18-74	26,680	23,260
HH-487	Reconstruct Sawdust Collection System at Moccasin Carpenter Shop	Wright Sheet Metal, Inc.	12-24-73	1-31-74	1,957	1,957
HH-488	Installation of San Jose Ave. Storage Track Trolley System	L.K. Comstock, Inc.	1-14-74	2- 8-74	10,800	10,843
HH-490	Moccasin Spillway Stilling Basin Exploratory Core Drilling	Pitcher Drilling Co.	5-13-74	5-23-74	3,763	3,819
HH-492	Construct Underground Duct System, Market Street-7th to 8th	Underground Construction Co., Inc.	5-13-74	-	146,306*	48,532
HH-493	Construct Underground Duct System, 19th Ave. and MUNI Right-of-Way	Underground Construction Co., Inc.	5-13-74	-	172,366*	149,251
HH-495	Road Repairs - Highway 120 to Cherry Dam	George Reed, Inc.	5- 6-74	6-27-74	29,975	27,010
Emerg.	Grout Leaks - Tunnel & Dam	Pressure Grout Co.	3-12-73	8-10-73	50,000	15,214
Emerg.	Repair Leak - San Joaquin Pipeline No. 3	Hetch Hetchy	2-26-74	-	45,000	32,000
DPW #23,506	Construct Underground Duct System, Judah Street	Homer J. Olson, Inc.	6-10-74	-	355,281*	-

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1973-74

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
BARTD 1S3026	Civic Center Substation	Northwest. Construction Co.	3-26-73	-	446,700	335,025
BARTD 1S0032	Church Street Substation	Fruin-Colnon Corp., Dravo Corp., & Rothschild & Raffin, Inc.	11-17-72	-	258,240	154,944
Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year						\$1,257,359

* Includes City Furnished Manhole Frames & Covers @ \$272.30 ea.

